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CONTENTS

ORIGINAL ARTICLES

Wound Diphtheria. Samuel K. Levy, New York City.....193
Statistical Reports—Organisms Producing False Membrane—Report of Cases—Symptoms and Diagnosis—Histological Picture—Treatment. Importance of this Infection—Bibliography.

Septic Teeth: Their Etiology and Surgical Treatment. Josef Novitzky, San Francisco, Cal.....196
Pyorrhea—What Constitutes Pyorrhea—Conditions Governing Treatment—Diagnostic Helps—Lantern Slides. (To be continued.)

Chronic Gall-Bladder Disturbances. A. Henry Dunn, Chillicothe, O. 204
Chronic Cholecystitis—Its Characteristics and Symptoms—Gallstones—Their Location and Formation — Treatment—Cholecystectomy vs. Cholecystostomy—Summary.

Adhesions In the Region of the Duodenum. Charles A. Hill and F. C. Larimore, Pittsburgh, Pa.....208
Two Kinds of Adhesive Bands—Etiology—Report of Cases—Common Symptoms—Special Symptoms — Prognosis—Treatment—Bibliography.

The Non-Enucleation Surgical Treatment of Certain Forms of Prostatitis. G. S. Foster, Manchester, N. H. 211
Histology—Pathology—Treatment—Interesting Reports of Cases—Their Treatment.

Personal Observations of the Care of the Wounded in the Great European War. R. C. Bryan, Richmond, Va. 214
Methods for Combating Infection—Dakin's Solution—Its use by Carrel—Paraffine Treatment of Burns—Plastic Surgery of the Face.

A Hernioplasty Retractor. Carl R. Steinke, Akron, Ohio.....217
Description of the Instrument—Its Advantages—Method of Use.

EDITORIALS.

Wound Diphtheria 218

Colostomy for Non-Obstructing Bowel Cancer 218

Doctors of America, Wake Up....219

SURGICAL SOCIOLOGY 219

BOOK REVIEWS.

A Practical Treatise on Fractures and Dislocations—Stimson. The Breast: Its Anomalies, Its Diseases and Their Treatment 220

The Newer Methods of Blood and Urine Chemistry—Gradwohl and Blavis. Handbook of Suggestive Therapeutics, Allied Hypnotism, Psychic Science—Munro. The Diagnosis and Treatment of Abnormalities of Myocardial Function—Hart 221

PROGRESS IN SURGERY. A RÉSUMÉ OF RECENT LITERATURE.

Lung Abscess after Tonsillectomy. Foreign body in the Oral Cavity. Fibroma of the Left Nasal Chamber. Removal of Tonsils.....221

Local Anesthesia for Tonsillectomy. Low-cost Motor Outfit. Xanthochromia. Septic Incomplete Abortion. Hydatidiform Mole. Nitrous Oxide Gas in Labor.....222

MISCELLANY.

Fat Embolism and Shock.....210

APPLICATION BLANKS FOR APPOINTMENT IN THE MEDICAL RESERVE CORPS, U. S. ARMY 223

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AMERICAN
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VOL. XXXI. AUGUST, 1917. No. 8.

WOUND DIPHTHERIA.*

SAMUEL K. LEVY, M. D.
of the House-Staff of Mount Sinai Hospital,
NEW YORK CITY.

The literature would indicate that a wound infection by the diphtheria bacillus is a rare occurence. I have found recorded, in all, less than fifty proven cases. The condition is, however, probably much more common than these reports indicate, since its nature is often unrecognized. Dawson[1] also expresses this belief. On the other hand, "it must be pointed out . . . that cases of wound infection are not common and that many of the membranous conditions following the infections of wounds have been proved by numerous observers to be due to other bacteria"[2] than the diphtheria bacillus.

Of 2,600 cases of diphtheria at Grove Hospital between 1902 and 1914, only 30, or 1.1%, showed cutaneous involvement.[3] At St. Anne's Children's Hospital, Vienna, in 2217 clinical and bacteriological cases of diphtheria (from 1894-1902) the skin was attacked in but 13 instances.[4]

It is variously stated (Knowles and Frescoln,[4] and Dawson[1]) that diphtheria of the skin was first recognized by Chomel in 1759 and by Samuel Bard in an epidemic in New York in 1771. In 1828, Trousseau published an extensive description of cutaneous diphtheria. According to him, it never develops unless the epidermis is broken. This is probably true, and cutaneous diphtheria is in reality, wound diphtheria. In this communication, however, I have in mind only diphtherial infections of gross and surgical wounds. It must be said that Daviot, as cited by Knowles and Frescoln does not hold the view of Trousseau and most other authors that a tissue loss is essential to cutaneous diphtheria infection; and Adler (cited by von Marschalko[5]) demonstrated that the uninjured skin of the guinea-pig can be thus infected, experimentally.

Such reports of instances of wound diphtheria as may have been published before the discovery of the bacillus by Klebs and Loeffler in 1883 and 1884, respectively, need hardly concern us, because various organisms may produce a membranous wound exudate simulating that of diphtheria. Only a positive bacteriological finding can establish the diagnosis beyond doubt, although in some of the recorded cases without laboratory investigation, the symptoms and sequellæ were indeed strongly suggestive. Neisser[6] published the first case bacteriologically proven in 1891. The first proven case of wound diphtheria that I have found in American literature was reported in 1897 by O'Connor[7] who found the Klebs-Loeffler bacillus in an ulcer developing upon an abrasion of the chin.

Various organisms are capable of producing a false membrane in an open wound:—staphylococci, streptococci, baccillus coli communis, baccillus pyocyaneus, and pseudo-diphtheria or diphtheroid baccilli. Some of these organisms may be found with the diphtheria bacillus. It is quite difficult, if not impossible, to differentiate by their appearance alone, membranes produced by these organisms from true diphtheria infections; and the more so since the latter vary much in color and other physical peculiarities.

It would appear that no variety of wound is immune to diphtheria infection. It may contaminate burns, bites, blisters, contusions, herpes, fissures, punctures, excoriations and operative wounds. It has often occurred in tracheotomy wounds as an extension from the throat. These I shall not consider here. Pitt[8] records a case of diphtheria of the umbilicus in a 14 days old infant. The Klebs-Loeffler bacillus has been found in the pus of a closed abcess. There are several recorded instances of post-partum diphtheria of the parturient canal.

CASE I. Stella M., age 10 months, admitted to the third surgical service (Dr. Elsberg) April 13, Operated upon the next day for pyarthrosis of the right hip. Postero-external incision with counter-incision in the groin. The temperature fell gradually from 104° at the time of operation, and after the fourth day it ranged between 99° and 100° until April 25th, when it rose to 103.8° falling again to 100-101° when imperfect drainage was corrected. The discharge gradually diminished and the wound granulated satisfactorily. On May 1st, it was noted that there was necrosis of the wound edges and deep fascia. At this time the temperature range was 101°-101.8°. May 5th: an exudate was found about the wound edges and in the depth the granulations were pale and flabby. The child was

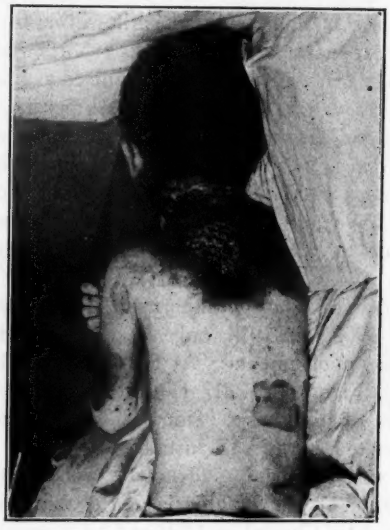
* From the 3d Surgical Service, Mount Sinai Hospital.

listless. The wound edges were curretted and the wound was irrigated with potassium permanganate solution. Staphylococcus aureus was found in the currettings. Temperature, 101°-102°. May 6th: Condition poor; wound appears distinctly necrotic; it has a yellow coating and an offensive odor, much like that of a dead mouse. Dr. Brickner, of the Attending Staff, made a diagnosis of wound diphtheria and ordered antitoxin injections, cultures and isolation. May 7th: Temperature, 103°-104.2°. Laboratory reported Klebs-Loeffler bacilli. May 9th: died.

CASE II. Morris T., age 4 years. Admitted to the third surgical service (Dr. Moschcowitz) June 10, 1916, with a fresh, extensive second degree burn of the left side of the neck, extending down on upper chest anteriorly and posteriorly, and the left arm and scattered areas on the back, produced by hot soup. The child was well nourished and not very sick on admission. The temperature declined from 102° on the first day to 99° on the seventh day. On the tenth day, it was noted that all the burns were granulating satisfactorily. The temperature was normal and the child was running about the ward. June 28th: Temperature has gradually risen to 101.6° June 30th: The entire wound of neck and left shoulder is covered with a dense, whitish exuberant membrane; temperature, 102°. July 2nd, the exudate appears yellowish, temperature, 100°-101°. July 4th: The entire neck and shoulder wound is extensively gangrenous. Its color is distinctly green. The gangrene extends as a black area to the adjacent unburned skin. (See photographs.) The wound is fetid but not suppurating and there is now no membrane. The child is cold. The pulse is very feeble. Dr. Brickner diagnosed wound diphtheria and ordered 5,000 units of antitoxin, cultures from wound, nose and throat, and isolation. Bleeding from nose and mouth, vomiting. Died. Klebs-Loeffler bacillus found in cultures from the wound and the throat, but not from the nose. Throat diphtheria developed on the same day in two other children in the same ward.

CASE III. Benjamin B, age 4 years. Readmitted to third surgical service (Dr. Moschcowitz) April 28, 1917 for recurrence of retrobulbar sarcoma of right orbit, removed 2 months before. May 1st: Operation by Dr. Moschcowitz. Radical removal of all the orbital tissues, including the periosteum. May 8th: Lid sutures removed. Wound clean, repacked with iodoformized gauze. Temperature not above 100°. May 15th: Orbit granulating satisfactorily. Child has been walking about. May 18th: Child awoke during the night, crying out with pain in the right side of the head. Vomited. Drowsy during the day. Temperature, 100.4°-99.5°. Yellow membrane in orbit. May 19th: Cultures from the wound show Klebs-Loeffler bacilli. 5,000 units of antitoxin administered. A few hours after its administration, the child vomited several times and had a left-sided convulsion with slow, shallow respiration. Temperature rising rapidly from 99.4°-103°; pulse (previously 80-116), 140-180. The child made a good recovery, but at this writing, 5 weeks from the onset, diphtheria bacilli are still recoverable from the wound.

Case II. Extensive gangrenous diphtheria of a large granulating burn.



Case II. Extensive gangrenous diphtheria of a large granulating burn.

There had been no diphtheria in this ward for a long time, but the ward on the floor immediately below had been isolated on account of diphtheria a short time before this case developed.

Wound diphtheria occurs in adults as well as in children. It affords no typical picture. The wound may present a dull, whitish, grayish or yellowish surface or give the appearance rather of being necrotic, and gangrene may develop, as in case 2. A distinct membrane is sometimes recognizable, and

its removal produces bleeding. The Klebs-Loeffler bacilli are recoverable from the membrane.

These wounds frequently discharge an ichorous pus, i. e., a bloody serous, or grayish brown fluid (Holm [9], O'Connor [7], Dawson [1], and Tavel [10]). There may be an offensive, "stale", "mousy" or "fetid" odor, or no odor. The wound is apt to be tender, painful and surrounded by an area of infiltration (Dawson [1], Evans [11], Züllig [12], Brunner as cited by Züllig, Burfeld [13], Bristol [14], Von Marschalko[5], Baginski and Adler as cited by Von Marschalko, and Pitt [3]). The neighboring lymph glands are only sometimes involved.

At the outset, there may be no general reaction; attention is first called to the changed appearance of the wound, not to the general condition. In a short time, however, there usually develop severe constitutional symptoms: fever, rapid pulse, marked prostration, vomiting and, often, death in a few days.

Trousseau, as cited by Bolton and Brewer [15], says: "The wound first becomes painful and 'a colourless fetid serosity' escapes, and a thick grayish flabby membrane appears on the surface. The edges of the wound are swollen and violet red in color. The disease does not usually extend but remains stationary for months. When the epidermis alone is removed, the raw surface becomes covered with a white membrane, and a reddening like that of erysipelas soon develops around it. On the surface of the latter, the epidermis is elevated in many points by small masses of 'lactescent serosity.' The vesicles thus formed run together and burst, the exposed dermis being then covered with a white membrane. These new centers join to the main center and to each other and so the disease spreads. The invasion generally takes place from the superposed parts toward the dependent parts, this probably being due to the irritation of the serous secretion. . . . When the disease extends rapidly the fever may be very acute, but it is usually like the hectic fever accompanying suppuration. The patient died after the manner of those suffering from malignant diphtheria."

Experimentally, Adler (as cited by von Marschalko) also describes a clinical picture which is inclusive of most of the characteristics mentioned above. He says, "The clinical picture shows a surrounding area of hard infiltration, red, like erysipelas. There are points of inflammation, which become confluent. The edges of these points are irregular, abrupt. They are yellowish or grayish white. Sometimes dirty, greenish necrotic areas are seen. If separation of the membrane is attempted, the base appears very red and bleeding. In the neighborhood of these there is marked edema. The surrounding lymph modes are inflamed but not tender. He took 19 cases which in no way correspond to this clinical picture and could find the Klebs-Loeffler bacilli in any."

Primary wound diphtheria is that form where there is no mucous membrane involved, while the term secondary wound diphtheria denotes a primarily involved mucous membrane with secondary involvement of the wound. It must be borne in mind, however, that Barrus [16] has shown that the Klebs-Loeffler bacillus may be found in the noses and throats of from 1% to 3% of healthy individuals. Schottmuller and Seitz have also found them (quoted by Züllig). There may be said to be three modes of infection: (1) Auto-inoculation (secondary diphtheria) (2) From another person, who may be a physician, as in Bumm's and in other cases described by Züllig [12]. This person may infect by contact or as a carrier. Those afflicted with wound diphtheria may very readily act as carriers themselves. (3) From infected objects. Abel found the diphtheria bacillus on toys months after. They have also been found on the shoes and hair of nurses and on hair brushes of patients. Wright and Emerson found them in the dust of diphtheria hospitals. Park found them in clothes of patients, and Howard found them in milk.

The histological picture is so variously and opposingly described that I have come to the conclusion that Frankel draws, that one cannot distinguish a true diphtheritic infection from a non-diphtheritic infection by the histology alone.

Various treatments are made mention of. However, all writers hold that the use of von Behring's serum is of prime importance for it is variously stated that wound diphtheria can produce constitutional symptoms, complications and sequellæ like those of nose or throat diphtheria. (Bristol [14], Burfeld [13], Baginski and von Marschalko [5], Weekly Bulletin, Department of Health, N. Y. C. [17]). Locally, Tuohy [18] made use of Bier's hyperemia, irrigations and poultices. Burfeld [13] used mercury biniodide 1:500. Randal Herley [19] scraped the infection, which looked like an anthrax pustule, and applied pure phenol. Holm [9] cleansed his own wound with a ten percent solution of formalin and closed it with celloidin. Bristol [14] used various antiseptics and states that staphylococcus and lactic acid bacilli sprays have been used. He used a live lactic acid bacillus spray several times each day, avoiding the use of antiseptics at this time. Locally, Adler used wet compresses of 1:1000 bichloride of mercury. After cleaning, he applied

a two percent. boric acid ointment. Züllig irrigated with one percent. bichloride of mercury and inserted iodoform gauze into the wound. Brunner (as cited by Züllig) disinfected with iodoform powder and applied a dry dressing. Bertelli applied the antitoxin locally with good results.

It may be mentioned that another characteristic of wound diphtheria is that in those who recover there is a tendency to chronicity of the lesion, during which time it is usually possible to isolate the organism from the wound. This is well represented in case 3.

It is the chief purpose of this communication to emphasize the great importance of watching for possible diphtheria infection of wounds in all hospital surgical wards. There may be any of the above-mentioned sources of infection. *Any unusual, atypical change in the appearance of a surgical wound should at once arouse one to the possibility of a diphtheritic infection* and *a reasonable suspicion should demand vigorous treatment.* A gray, yellow, white or necrotic appearance in a previously healthy wound, particularly if the wound presents other of the above-mentioned findings, should lead one to take a culture, isolate at once, and administer antitoxin in large doses without waiting for laboratory confirmation. The mortality is high, and the chance of recovery decreases with the length of time that elapses before the diagnosis is made. When constitutional symptoms have become marked, it may be too late to save the patient.

I wish to express my gratitude to Dr. Walter M. Brickner for his kindness in suggesting and directing this study, and also to thank Dr. Leopold Brahdy of the House Staff of Mt. Sinai Hospital for assisting me in translations of the foreign literature. I am indebted to Drs. A. V. Moschcowitz and C. A. Elsberg for permission to cite the cases.

200 BEVERLY ROAD.

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SEPTIC TEETH: THEIR ETIOLOGY AND SURGICAL TREATMENT.[1]

JOSEF NOVITZKY, D. D. S.
SAN FRANCISCO.

Much pseudo-professional advice is being recommended for the correction of various septic dental disorders termed "pyorrhea." Teeth that are hopelessly necrotic, thoroughly septic, dead in every sense of the word, are said to be affected by "pyorrhea." Due to the lack of experience, knowledge, and study of pathological symptoms, healthy as well as unhealthy states of the dental joint are said to be the results of "pyorrhea." The use of the term would excite merriment, if we could forget the misguided patients.

"Pyorrhea" is not a disease distinctive in itself. The term "pyorrhea" should be regarded as an obsolete one.[2]

Now, before we can intelligently diagnose septic infiltrations of teeth and their supporting structures or differentiate those infiltrations amenable to conservative treatment and those not amenable to such treatment, we must consider the underlying causes of the septic infiltrations.

[1] Presented before the Surgical Section of the San Francisco County Medical Society, January 16, 1917.

[2] "Pyorrhea" is used in this paper, because of the general usage of the term. This term should be restricted to inflamed or suppurative conditions of vital tooth joints. Traumatic or septic gingivitis, with or without pericemental detachment, would probably be a more appropriate term. Advanced types complicated by absorption and fibrous degeneration of the alveolar process should be so designated when making the examination. The term pyorrhea meaning a "flow of pus" would be less explicit than the use of "heart disease" as a means of diagnostic expression in pathological conditions of the heart structure.

What Constitutes A "Pyorrhea."

Traumatic, septic gingivitis, with or without detachment and infection of the pericemental fibers of a vital tooth, would be a clinical representation of what is commonly understood as "pyorrhea." Acute or chronic inflammation or suppuration of the tooth joint, immediately below the gingival margin of a vital tooth root, the affected area not communicating with the apical region or with the mouth, would be considered a "pyorrhea," probably of embolic origin. The acute type would be distinguished by the typical characteristics accompanying acute suppuration; while, the earlier stages of the chronic type would usually escape notice. Roentgen-ray examination of the earlier stages, however, will show absorption of the alveolar process; also the gums will appear thicker than the normal and resemble a fibrous hypertrophy.

In chronic cases there will be kept up a low grade inflammation probably maintained by serumal deposits on the tooth roots, the result of exudation of blood fluids and corpuscles through the vessel walls. Pathological tissue changes may result in an acute termination. This usually follows gingival detachment. The prognosis of this type is unfavorable, because of the uncertainty of locating the foci or original cause of the trouble; and also because of the extensive destruction of alveolar walls and pericemental structure.

The gingival margin, ordinarily, may be considered as the common location of a beginning "pyorrhea." This may be due to septic embolism; but it is usually due to thrombosed bloodvessels, the result of local irritation or trauma. The cyanosed, swollen, relaxed gingiva provides opportunity for retention of food and septic substances. This retention ultimately assists in bringing about gingival and pericemental detachment. The forces of mastication from now on, assist in the destruction that follows. Many infections of the dento-alveolar joints of vital teeth have been observed to improve and disappear after the operation of a necrossed antrum floor, or the removal of dead teeth and carious alveolar process. In fact, the condition of the entire mouth and often times of the tonsils has been apparently permanently improved, by such removal of dead structure. Now, whether the gingival suppurations are reflections of the other septic disturbances by proximity of septic drainage, or whether the complications are due to a metastatic complication probably brought about directly by the blood circulation, it would not always be possible to say, with any considerable accuracy.

Hartzell, one of the workers appointed by the National Dental Association, claims that proximity of suppuration allows pathogenic organisms to penetrate through the gingival ring, into the dento-alveolar joint of normal teeth; and he cites his experiment of blowing oxygen gas under the gingival margin, demonstrating that the gas penetrates into the socket.[3] He believes that if oxygen gas penetrates, bacteria will also; and to him this explains why he finds streptococcus viridans in the apical region of normal teeth. Hartzell further states that hematogenous infection of the dento-alveolar socket could not emanate from a suppurating tonsil, because tonsillar infections are invariably of a hemolytic strain; a strain that, according to Hartzell and Henrici, is rarely found in a pathological tooth socket. Hartzell apparently believes that a septic tonsil would be apt to cause dental suppurations by direct continuity of tissue. This certainly would be correct in many instances.

Many of the grave general septicemias that have been traced to tooth, tonsil or nasal infection, will show a septic gingival margin of all teeth, from which pus can be obtained. This condition may or may not be associated with gingival or pericemental detachment. Pus, pus producing, and other organisms, certainly do not penetrate into the dental sockets in most cases. The normal unrelaxed gingival ligament seems to prevent penetration. The sticky mucous secretion may possibly also have an inhibitory effect on bacterial migration. The average penetration through the gingival ring, however, does not take place until the parts become relaxed, or until trauma assists in the penetration.

If Hartzell were correct in believing that all socket infection took place by means of penetration of pathogenic bacteria, through normal unrelaxed gingival ligaments, we should expect to see acute "pyorrhea" in all intensely septic mouth cases.

Extremely septic mouths are more or less bathed with pus. If a diagnosis of "pyorrhea" is made and meddlesome poking and scratching at the root surface is undertaken, infection of the dental socket follows, with possible irreparable damage to the tooth and tooth joint.

Hartzell's oxygen insufflations into the normal dental socket, probably penetrate because of the pressure that is used and also because of the burning effect of the pure oxygen on the tissues. His findings of streptococcus viridans at the apices of normal teeth are results that I can not confirm; as I have found such teeth invariably sterile.

Hartzell's findings of pathogenic organisms in

[3] Pacific Dental Gazette, December, 1915.

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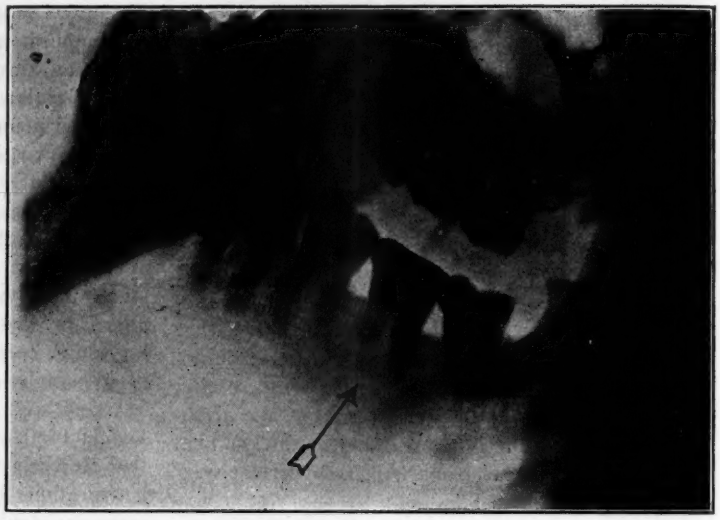

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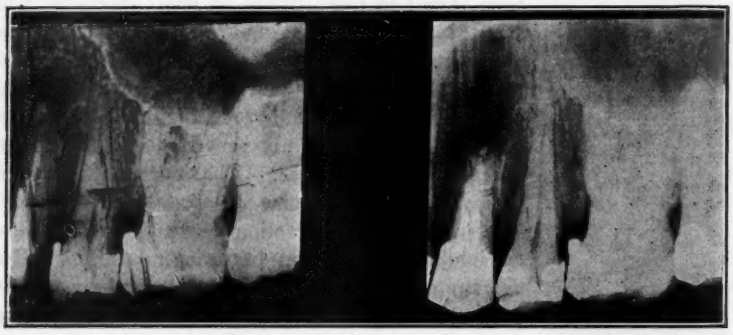

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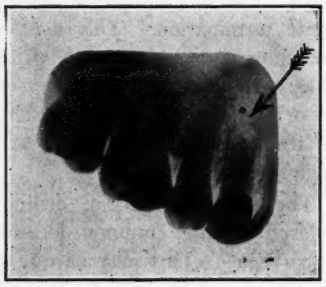

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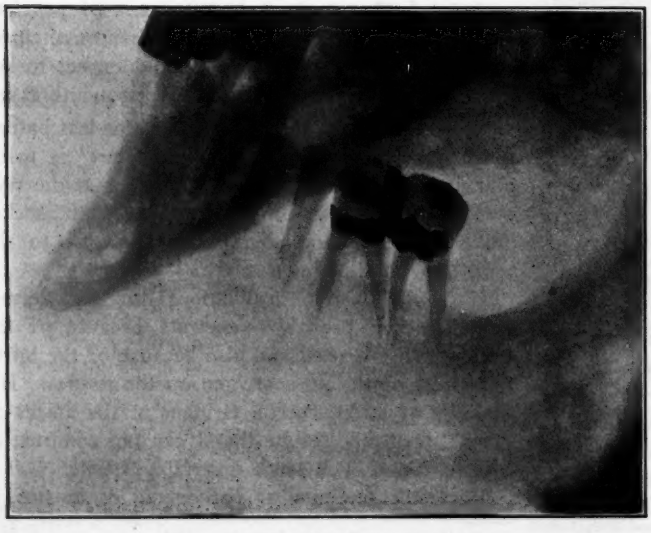

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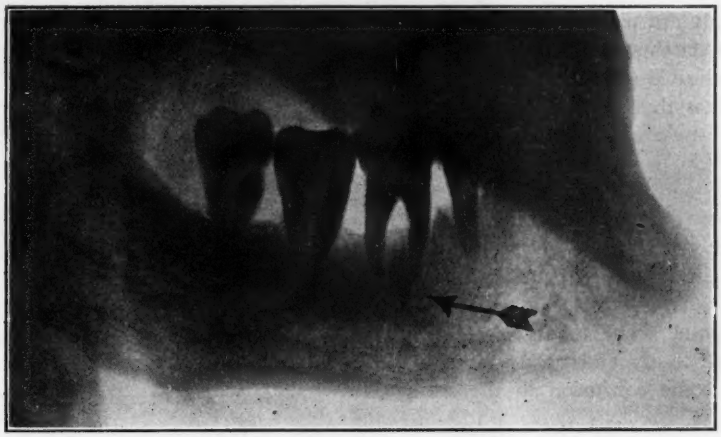

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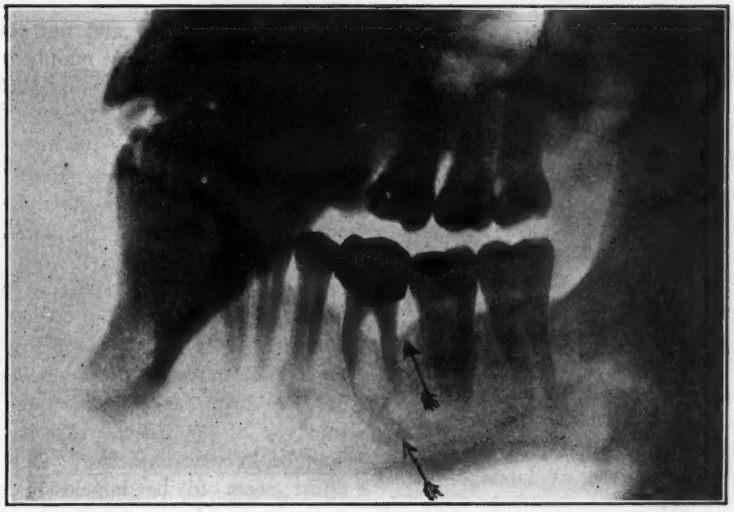

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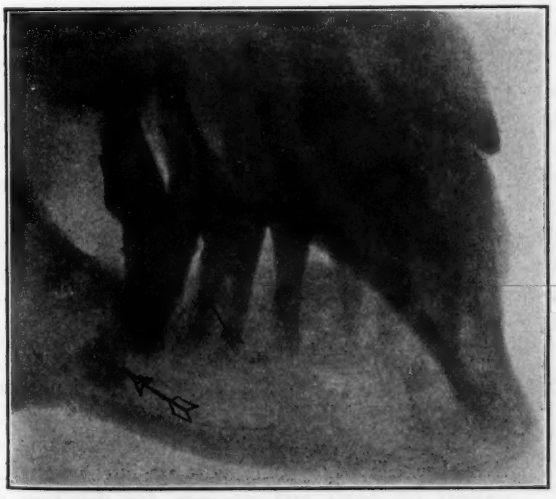

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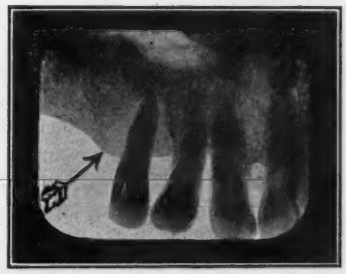


Slide 10.

normal tooth joints are undoubtedly due to faulty technic. Also his statement that suppurating tonsils could not be responsible for an embolic "pyorrhea," because of the fact that hemolytic organisms are seldom found in these dental infections would probably be accurate, if it were proven that only hemolytic organisms would be carried by the blood stream; and also if all hemolytic strains could readily be identified as such.

Streptococcus hemolyticus has been isolated from some of my cases, though it is very true it is not commonly found. The theory of transmutation when applied to streptococcal strains, would be apt to cause some confusion in the study of these organisms.

Some of us are apt to believe that the last word has been said regarding the different streptococci and also other bacterial organisms. The difficulty, however, that I have in securing uniformity in bacteriological reports, indicates that the faults are not always due to the surgeon's technic. There is a possibility that the different strains of bacteria are not always recognized; also the causes which influence changes in bacterial strains are not always correctly interpreted.

In his discussion of tooth cementum, Hartzell[4] speaks of lacunae as being most numerous near the ends of the dentinal tubuli and diminished in number as the surface is approached. This contradicts the view of men that make dental histology their life work. The general findings have been that human cementum, particularly the first deposition on the tooth root, on that part next to the tooth dentin, is usually free of lacunae. It is merely a structure less calcic exudate from the socket, which serves as an attachment for the ligaments of the dento-alveolar joint. I believe Hartzell's bacteriology will prove as defective as his dental histology.

His ideas regarding the treatment of dead abscessed teeth, will also bear scrutiny. He speaks of finding sterile abscess bags on the ends of extracted teeth, following electrolytic treatment of such teeth, before removal. This would be good news, if these results were due to such attempts at sterilization. There would be no more tonsillectomies; no more operations for necrossed bone. In fact, who knows where we should stop? Turn on the "juice" and annihilate infection.

This ionic medication, as advocated by Hartzell, M. S. Rhein of New York, and others, would be a questionable procedure when confined to soft structure. When used to treat a dead, stinking tooth, it could be considered only as an effort to retain in the human body that which should be thoroughly removed by radical surgery. Hartzell claims to find sterile abscess bags post operative to ionic treatment. I have no difficulty in securing negative bacteriological reports from such specimens, with no treatment whatever.

Laboratory or surgical procedure may be faulty, or again, the bag may be a retention cyst, with sterile contents. The sterility of the contents, however, does not necessarily mean that the bag could be considered harmless to the body of its host.

TREATMENTS MUST BE GOVERNED BY CONDITIONS PRESENT.

Serumal deposits that are industriously removed by the dentist, are generally the result of the inflammatory reaction and not the direct cause of it. They are composed mainly of blood fibrin and an earthy salt, undoubtedly calcium; and may be considered as the result of exudation of blood fluids and corpuscles through the blood vessel walls.

It will readily be understood then, that cleaning and scaling teeth may remove deposits that are apt to keep up the inflammatory trouble; but the most ignorant enthusiast would hardly feel that he had removed the cause of these serumal deposits. Excess occlusion, or septic or other embolism will cause a thrombosed blood supply of the dental socket, followed by exudation of blood fluids and formation of serumal deposits. This is the type of "pyorrhea" that has been laid at the door of "gouty diathesis." Here again, cause and effect seem to be hopelessly confused. Septotoxemia would probably be the modern version of "gouty diathesis." The term diathesis, in this instance, indicates a convenient inaccuracy in diagnosis.

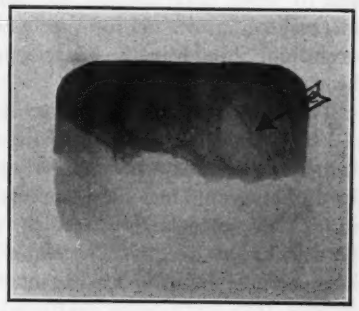
If the exudate is caused by the pinching of bloodvessels passing through the pericemental fibers, due to excess occlusion during mastication, the adjusting of the bite with temporary immobilization of the tooth in its socket, will be of more importance than the tooth scaling.

Salivary deposits, loss of mesio-distal tooth contact, irritation from imperfect dental work, mal-occlusion, loss of opposing teeth for occlusion, thickened alveolar process with impoverished blood supply, dead teeth, tonsil and upper air passage infections, systemic cachexia, these all influence the method of treatment.

It will readily be seen, that from this point of view, the use of hypodermatic or intravenous injections of drugs and vaccines for the cure of

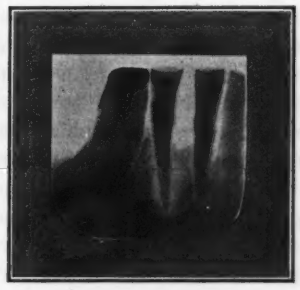
[4] Pacific Dental Gazette, December 1915, page 183.

Slide 11.

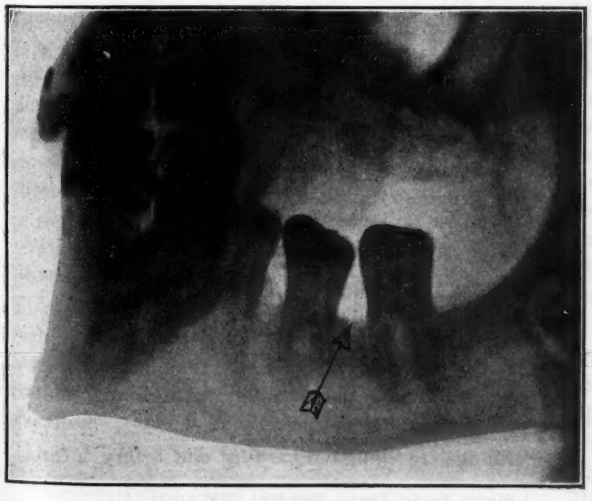


Slide 15.

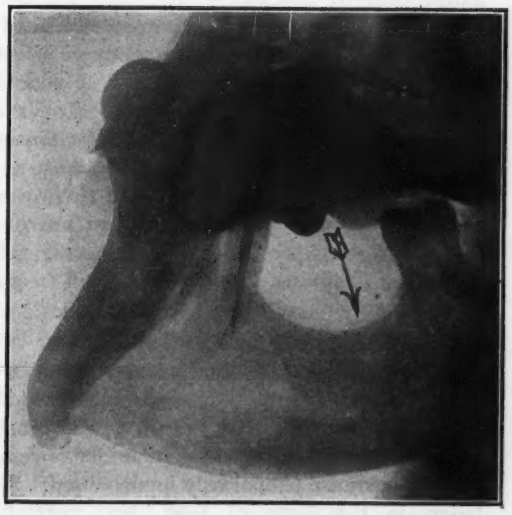
Slide 12. Eighteen months after Slide 11.



Slide 14. Part B.



Slide 13. Eighteen months after Slide 12.



Slide 14. Part A.

tooth exfoliation, the results of disuse, for sclerosed alveolar process and lessened blood supply, the result of septic inflammation for trauma from purely mechanical insult, or for mechanical problems of occlusion, should justly be relegated to the scrap heap.

The cure of "pyorrhea" depends on two factors:—First, the early removal of the cause of the inflamed condition; second, the amount of tissue lost. This would include the extent of tissue change in the dento-alveolar joint and the amount of osteoporosis in the alveolar process. Tooth roots that have become infiltrated with mouth fluids or root sockets that have been destroyed along with the pericemental cells and fibers, can not be restored to normal. Expectant treatment applied to these conditions would be anything but conservative. Conservative treatment would take the form of radical removal of the infected parts.

Diagnostic Helps.

A diagnosis of "pyorrhea" will be determined only after a thorough examination leading to the cause of pericemental infection and detachment.

If the cause of suppuration is purely local in the form of imperfect dental prosthesis, or abnormal occlusal stress; mouth examination and the study of plaster models of teeth, showing the direction and force of occlusion will be necessary. A radiographic study of the entire jaws and teeth, whether partly edentulous or not, will give material assistance in diagnosis. Blood pressure is taken and urinalysis is made as a matter of routine. A general medical history is at times illuminating.

The fact that any of the chronic and also acute pathological changes in the dento-alveolar joint, independent of gingival involvement, are due directly to septic embolism or to a contaminated and impoverished blood supply, the result of infectious focci close by, seems to have escaped notice. If the pathology is due to the presence of a dead tooth, carious alveolar process, or infection in accessory air passages, or tonsils, these, must be corrected; otherwise, little permanent improvement need be expected. Suppurations that are of metastatic origin, when in the hands of the general dentist for diagnosis of direct cause, will frequently necessitate the services of a consultant.

Types of Cases and Treatments.

Cases due to simple local causes, taken in time and treated before the tissue cells and dento-alveolar joints have lost their identity, will return to normal health after the cause of injury is removed and the teeth are temporarily immobolized. Stimulation in the form of long, hot, normal salt irrigations will shorten the time of resolution. Reattachment of pericemental fibers and cemental formation with complete recovery may be expected.

The so-called systemic "pyorrhea" will be observed in cancerous cachexia and other wasting diseases, that not only lower the general tone and resistance, but also inhibit local healing and offer opportunity for inflammation and suppuration to run a riotous course. General mercury and lead poisoning, when associated with dental suppurations should be considered as local irritants, because of their elimination by the salivary glands.

A blocked and contaminated blood supply would probably be classed as a systemic cause for "pyorrhea;" though the cases that have been thought to be due to this cause, were restricted to tonsil, mastoid, air passage and dead tooth and necrosed jaw suppurations.

The treatment of these dental troubles will bring about no permanent improvement until the exciting cause is removed. The chronic cases are insidious in their development, and are usually accidentally discovered with the *x*-ray. Examinations will show an apparent atrophy of the alveolar process, which is frequently diagnosed as a physiological atrophy. Senile and possibly interstitial atrophy are the only physiological atrophies of the alveolar process Other forms should be considered pathological.

Lantern Slides.

Slide 1—This was taken from the work of Noyes. I have reason to believe that the blood vessels that dip down into the dental socket from the gingival margin, are probably as important as is the supply coming up from the apical region. Other vessels will be seen penetrating through the lateral walls of the alveolus into the dento-alveolar joint.

This threefold blood supply was demontsrated as early as 1870 by Wedl, a German. Hopewell Smith, the English Histologist, and Noyes, the American, have also demonstrated this supply, not only in human beings, but also in developing tooth buds of other mammals.

Some of the arteries terminate in the apical region, while others terminate midway in the dental joint.

Some years ago Black[9] stated that it was difficult to determine whether the blood vessels entered the dental joint in the apical region, or whether they ended there.

Billings' teachings regarding end artery infarct,

[9] Black's Special Dental Pathology, 1915 (page 117).

will appear pregnant with meaning in the study of septic involvements of tooth sockets.

It will readily be seen that circulatory disturbances of the tooth socket could be brought about in several ways:—First, by end artery complications in the form of sclerosed vessel walls, or direct embolic troubles; secondly, by thrombosed gingival supply from irritation or trauma directly on the gingival margin, due to defective dental prosthesis or many other purely mechanical injuries; thirdly, by the pinching of lateral blood vessels between the socket ligaments, the results of excess or malocclusion. This circulation with the exception of the apical supply is not necessarily immediately interfered with following death of the pulp.

The question has been asked: if a devitalized tooth is dead and putrescent, why is it not exfoliated?

It will be seen from this slide that the root of a tooth is covered with a deposition of cementum, or cement substance, that attaches the fibers of the pericemental ligaments to the tooth root and retains the tooth in its socket. This cementum is laid down by the specialized cells of the alveolar socket, the cemento-blasts, irrespective of whether the tooth is vital or not.

The few dead teeth that seem to be harmless as far as local or systemic injuries are concerned, are probably securely encapsuled with calcic exudate over the entire root length and apical foramen, Lecunae, when present in cementum are irregular, much distorted, and usually imprisoned in the lamellae, instead of lying between them.[10] The weight of evidence supports the theory that cementum is normally structureless. The presence of lacunae is due to inflammation.

It will be seen, then, that death of the pulp leaves the tooth with no source of nourishment; and subject to the laws of decomposition which influence the changes in dead organic matter.

The prognosis relating to the future use and retention of dead teeth, probably depends on the covering over of the apical foramen by calcic formation from the socket: also the prevention of rapid putrefactive changes in the tooth dentin.

The question has been asked: why are dead teeth less mobile in their sockets than living teeth? This probably is due to the fact that the pericemental fibers are generally rapidly calcified, following pulp removal. The socket, many times, becoming almost obliterated results in more or less ankylosis. This is confirmed by operation.

Noyes claims that he has never seen a true ankylosis, as remnants of a fibrous layer are generally present between the calcified layers.

Replanted teeth are always ankylosed. These teeth are prepared by sterilization in bichlorid of mercury solution, and after other appropriate measures, are replanted. The blood fluids that fill the tooth joint, result in a complete obliteration of the joint space, by calcic formation. This technic will give as high a percentage of successful replantations, as the technic that has been advised by others, in which efforts are made to preserve the bodily temperature in the tooth to be replanted, with the idea of keeping imaginary cell and vessel structure alive on the root surface; so that "vital" re-attachment will take place with the socket.

Slide 2—This shows a lower second molar, eight months after replantation. The root ends have been amputated, the tooth has been bathed in bichlorid solution, followed by normal salt, and the canal work has been done before the replanting. The tooth is now carrying a half crown and is standing heavy mastication.

Slide 3—Before root amputation of upper 1st bicuspid. The second view shows the same tooth three weeks later, indicating rapid bone formation.

Slide 4—Same case 2 years after operation. The typical joint appearance extends over the amputated root end.

Slide 5—This is one of the advanced stages of tooth exfoliation, the result of twelve years' lack of occluding surface. The tooth roots were still vital, but were septic from the infiltrating mouth fluids. The patient was given the emetin treatment about one year ago to "cure" this condition.

Slide 6—Another case of exfoliation complicated with sclerosed alveolar process, the probable result of septic inflammation. Such teeth should be removed. Attempts to "cure" them would be a waste of time.

Slide 7—In this case, blood vessels supplying the bicuspid teeth were found blocked. This was noticeable on the gums over the bicuspid teeth. There is a probability that other small vessels that are not in plain view, are similarly affected. Notice the absorption of alveolar process between the bicuspids. Here is a clear picture of an early pathological atrophy following embolic inflammation. It is much in advance of any visible suppuration. Urinalysis in this case indicated a trace of sugar and of albumen. Nose and throat were negative as far as active suppuration was concerned. There were a few septic teeth present.

Slide 8—This slide is the same case as slide 7. Notice the alveolar wall destruction around the

[10] Hopewell Smith's Dental Histology.

lower 1st molar and also the areas of thickened cancellous bone. This tooth is thoroughly septic.

Slide 9—This patient reports every now and then, with an acute abscess of the dental joint, the gingival margin being normal. Since the apical region also is not involved, the trouble seems to be a hematogenous infection about midway between these two points. The patient has one dead tooth. He also has a history of nasal and mastoid suppuration. He is attacked with an acute skin affection about every 12 months, which has been diagnosed as "Poison Oak." Note the thickened area of bone immediately below the 2nd molar. This is in the bone and should not be confused with calcic formations in the submaxillary glands.

Slide 10—The same patient as in the preceding slide. This shows the secondary destruction in the alveolar process of the 2nd bicuspid tooth, caused by the forces of occlusion, following an embolic abscess of the dento-alveolar joint.

Slide 11—An atrophy of the mandible. Above is an antrum infection resulting from two septic molars.

Slide 12—Same as preceding case, 18 months later. Note the alveolar resorption between the gingival region of the molars. A small fragment of process is still in evidence on the front surface of the last molar.

Slide 13—Same as preceding case, 18 months later. Notice the extensive loss of alveolar septum. The lack of function is assisting in alveolar destruction. The resulting resorption differs, however, from that induced by excess of occlusion, which causes a greatly enlarged socekt from the lateral stress.

Slide 14—This X-Ray of the mandible shows an area and a small vent which apparently permitted subperiosteal drainage. An abscessed tooth had been "pulled" from this socket 30 years before. At operation offensive granulations were removed. A little thin greenish blue pus was evacuated. The cultures unfortunately were contaminated, as were those from the abscessed lateral seen in the smaller section. This lateral pulp death was undoubtedly due to a septic embolism. The serumal deposits on these roots were removed and sent to Dr. Victors for examination. Dr. Victors reported that they consisted of blood fibrin and an earthy salt, undoubtedly calcium. This was interesting as it agreed with both Dr. Victors' ideas and my own, regarding the formation of these deposits. It showed that they need not necessarily consist of urates.

Black[11] stated that to his knowledge no analysis had ever been made of these deposits.

These are the deposits that have been laid at the door of "gouty diathesis."

(*To be continued.*)

CHRONIC GALL-BLADDER DISTURBANCES.

A. HENRY DUNN, M. D.,
CHILLICOTHE, OHIO.

Explorations within the abdomen have demonstrated the frequency, of as well as the common failure to diagnose, gall-bladder affections.

The most frequent chronic conditions for consideration are cholecystitis, cholelithiasis and malignancy.

CHRONIC CHOLECYSTITIS. Chronic cholecystitis may be with or without calculi; in the majority of cases it is associated with calculi. Cholecystitis is practically always bacterial. Streptococci, colon and typhoid bacilli are the most common germs.

Rosenow and Dunlap have produced 6% of cholecystitis with streptococci, in the recent streptococcus sore throat epidemic, in Chicago. In connection with the harboring of streptococci in the throat and sometimes in the appendix, this has obvious significance.

Rosenow demonstrated that gall-bladder streptococci have a special predilection for the gall-bladder in 80% of the experiments if injected into the veins of animals.

Typhoid and colon bacilli are not nearly so frequently responsible for the infection as was formerly contended.

Cushing claimed that 30% of gall-stones cases gave a history of typhoid infection, but the Mayos' did not confirm this finding.

As to whether infection reaches by portal circulation, general circulation or through the duodenum, evidence appears to support the view that anyone of these sources may be responsible, but that the portal and general circulations are most frequently the origin. Deaver mentions the lymphatics and juxtaposition as sources of infection.

Like peptic ulcer, though not with such regularity, cholecystitis is capable of a quiescent stage. The mildness of infection is not necessarily a guide in chronic cases as to extra-cystic pathology. Accompanying cholangitis and pancreatitis, are not infrequently found in chronic clinically mild cases, —cases that were treated for years for "gastric catarrh."

[11] Black's Special Dental Pathology, 1915.

Humanity would have been far better off, had the term chronic gastric catarrh, never been coined.

Like rheumatism, the term gastric catarrh, has served the doctor wonderfully in his explanation to a patient whose gastric condition could only have been helped by more thorough study and observation or exploration.

Dyspepsia is the most common complaint in cholecystitis. I know of no other condition that can be diagnosed by exclusion as much as can gall-bladder dyspepsia. Gall-bladder dyspepsia has no pathognomonic sign except it be, indeed, its irregularity.

To put it as it often occurred to me during operative surprises, if you are put in a position where you have to guess on lesions of the upper abdomen, you will more often guess right on accusing the gall-bladder than all other organs put together.

Peptic ulcer will announce itself, typically, by the history of pain at definite intervals after food ingestion, relief by food or alkalies, hyperacidity, fall and winter recurrences and *x*-ray findings.

Other diseases are frequently recognizable by other regular signs or symptom-complexes. But when there are irregular dyspepsia, irregular x-ray findings, irregular pains and irregular gastric findings; in short; if you have to deal with a dyspepsia so irregular that you must guess, then most likely it is due to a gall-bladder condition to deal with. We assume that ptosis and other conditions have been excluded.

Needless to say, characteristic colicky pain, especially with jaundice or Charcot's fever, with a positive Murphy deep finger palpation sign or stones in the stool, a diagnosis is comparatively easy.

Distress in the right hypochrondriac region, if present, is of great value and may be the only local symptom elicited.

I wish to mention the value of stomach analysis, if correctly estimated. The work of Rehfus and his collaborators has revolutionized the conception of gastric residue and chemistry. The Rehfus tube has been of greatest assistance in the fractional study of gastric activity in my cases of dyspepsia.

In doubtful cases I heartily voice the opinion of the great surgeon, Moynihan, who says that because surgery has done so much in dyspepsia, and the mortality of exploration is practically nil, an exploratory operation is in order far more frequently than we have had it heretofore. "This is the only prophylaxis worth considering in gastric cancer cases, and your dyspepsia may be an early gastric cancer, cleared up by this laparotomy" (Moynihan).

When there is a mass in the right subhepatic region, where you are in doubt as to whether it is gall-bladder or kidney, it is usually the gall-bladder. This, of course, applies to cases that present no symptoms beyond the mass.

Undoubtedly, many cases of gall-bladder disease simulate peptic ulcer and appendicitis. The latter is especially true in children in whom the cecum is higher and the liver lower than in adults and hence the appendix and gall-bladder are closer neighbors. I do not feel much provoked if, in a child, a presumed appendicitis proves to be a gall-bladder disease.

Recently I operated upon a woman who had her breasts and adnexa removed for cancer. She showed lactic acid, achlorhydria, occult blood and continuous vomiting of bile and a 12-hour residue. Most of these signs spoke for gastric cancer except the vomitus of bile, but she had a strawberry gall-bladder.

The more I explore the abdomen the more I am convinced that, though many symptoms are caused by definite lesions and many more symptoms are neurotic, yet there are nearly as many lesions in the abdomen that show no symptoms. A gall-bladder lesion is one of the most frequent of this kind.

As a parallel I cannot resist quoting Wilkie of the Royal Infirmary, of Edinburg, who found nearly 10% of duodenal ulcer in 490 autopsies at the Infirmary, only six of which had been diagnosed antemortem.

To my mind the well known statistic compiled in Germany, where 12% of autopsies reveal gall-stones, do not begin to cover the percentage that could be found as having gall-bladder infection without stones.

More than 10% of the operative cases at the Mayos', have gall-bladder affections, accompanying other conditions. On the other hand, many operations for gall-bladder disease, often reveal other diseases, some inoperable. How many cannot confess to operations for gall-bladder disease that have demonstrated inoperable cancer of the liver?

Jaundice is the one great symptom that is mostly responsible for these many unnecessary operations. I think jaundice is too often waited for by some men before clinching the diagnosis. Jaundice in a gall-bladder disease, like hematemesis in gastric ulcer, has been for many years the pathognomonic symptom among us. It is mostly to the surgeon's credit that he classified jaundice as a symptom of extra-cystic rather than intra-cystic trouble.

Surgically, jaundice stands for obstruction. The obstruction is either inflammatory within or with-

out the common duct and may have nothing to do with the gall-bladder, or it may be obstruction inside the common duct by stones or ascaris lumbricoides, or obstruction outside by tumors or enlarged lympth glands. Seventy percent. of common duct stones cause jaundice some time in the course of the disease.

A. O. G. Kelly claims that 35% of cholecystitis without stones produce jaundice. My cases do not show so high a percentage.

Steady persistent jaundice is rarely biliary jaundice, but is malignancy of the liver; when due to malignancy it is usually painless and of slow onset. A duct jaundice is usually not so deep or so persistent.

The gall-bladder is atrophied in 86% of cases of common duct jaundice (Courvoi sier), therefore a mass of jaundice usually mean malignancy.

Emaciation rarely precedes biliary tract jaundice if there be food toleration. Food toleration usually is the case with liver malignancy, in my experience. In other words, if there is emaciation in biliary disease, it is mostly due to food intolerance for a protracted period, whereas in malignancy the cachexia is not a direct starvation cachexia; loss of weight is only part of the cachexia.

The surgeon encounters cases of malignancy due to gall-stone irritation; such was the case in 4% of the cases operated on by the Mayos.

About 90% of primary carcinoma of the gall-bladder have stones, and only 15% of secondary carcinoma. This proves the importance stones play in malignancy (Kehr). Moynihan's records show that 95% of his cancer cases in and around the gall-bladder are due to stone irritation. In these cases the previous history of stone will not help to decide that the case is not beyond operability, nor will it help the diagnosis. Besides there usually is a period of quiescence to mislead one in the history. Hence, operations too late in these cases will always be performed to some extent.

Most liver malignancies are secondary to that of cancer in other organs, especially the gastro-intestinal tract. One-third of the cancers in the body are situated in the stomach.

Most primary liver carcinoma is with cirrhosis, which is one of the main reasons primary carcinoma is often taken to be cirrhosis until very late in the cancerous involvement.

GALLSTONES: Three women to one man are victims of this malady. At least 5% of the population is estimated to have gall-stones. Twenty-five percent. of all women have gall-stones (Naunyn).

Many experimental mild cholecystitides result in gall-stone formation.

Infection is so frequently a cause of stone formation, that it was believed to be invariably the cause of stones, but Aschoff's late experiments, which are very reliable, lead him to the conclusion that stones may form without infection. Aschoff states that the cholesterin from the dead epithelium in the gall-bladder can form stones without infection. Cholesterin, as we know, forms about 75% of the stone and the rest is lime salts. This is important to remember when taking *x*-ray pictures for stone detection. Clumps of bacteria are often found in the nucleus of stones, but not invariably.

Rovsing has proved that the gall-bladder is sterile in 50% of gall-stone cases, and he contends that if infection be present with gall-stones it is secondary. He cites urinary stones as an example that calculi do not tend to become sterile in time, but rather to become infected, so that his conclusion is that most of the infected stones become so in time but were sterile to begin with.

The location of formation is of great interest to surgeons. The gall-bladder, undoubtedly is the chief seat of formation. Occasionally a stone is formed in the intraphepatic duct. This is important, since the question after cholecystectomy arises sometimes as to whether recurrence of the colic has been caused by a stone overlooked at primary operation or by a stone formed after cholecystectomy.

The opinion of good men appears to be that the formation in the hepatic duct is so rare that the greatest prophylactic against formation of stones after cholecystectomy is removal of all stones at the time of the primary operation. This is true as to stone but it cannot be said of all biliary troubles, for trouble of the biliary tract is frequently encountered after cholecystectomy.

SYMPTOMATOLOGY. Many cases are overlooked because of the mildness of the symptoms or absence of symptoms. Many more are treated for other diseases, but most often for chronic gastric catarrh. Dyspepsia is the most frequent mode of manisfestation of gall-bladder trouble of any kind, though the dyspepsia case is the exceptional case that reaches the surgeon for primary biliary tract operations.

Cases come to the surgeon usually for jaundice, for fever and for colic and distress,—very rarely for dyspepsia unless it is because peptic ulcer is suspected.

The aid of the *x*-ray specialist has been of great assistance in the diagnosis of gall-bladder conditions in some cases. About 50% of gall-stones are demonstrated by some *x*-ray men, notably Cole and Carman. The average *x*-ray man does not get so

high a percentage of positive radiographs for stones.

The value of the x-ray is further enhanced in the exclusion of gastric and duodenal ulcer, yet many pylorospasms that are reflex to gall-bladder or appendiceal trouble will give a residue and findings misleading the surgeon. The absence of residue, hyperperistalsis, duodenal deformity and other *x*-ray findings, greatly facilitates the diagnosis between gastro-duodenal and biliary trouble.

The primary biliary tract case that comes to the surgeon does not come for gall-stones *per se*. They come for symptoms that result from complications such as stones in the common duct, stones impacted in the cystic duct, cholangitis of the cystic, common duct or the deep ducts of the liver with or without pancreatitis. Often it is difficult to recognize these complications even on exploration, and this is important when we come to discuss cholecystostomy *versus* cholecystectomy.

TREATMENT: The sooner the physician comes to the conclusion that the dyspepsia is a surgical dyspepsia and the sooner the physician calls in the surgeon, the less discredit will he incur to himself and his colleagues. The most frequent cause of failures in operation is waiting until the ducts are full of stones or inflamed. Many patients will not listen to the advice, but eventually will be grateful even though they get away and make the rounds of the various cults for amelioration. An important point I wish to make is that many cases of cholecystitis, if without stones, are overlooked at operation.

After the patient comes to the surgeon and a diagnosis is made the procedure in the particular case will differ with the particular surgeon.

The question "cholecystectomy or cholecystostomy", has occupied the arenas of surgical gatherings for a few years. After the smoke of the battle has cleared away, the impartial average surgeon will find many more cholecystectomies indicated than have been performed, yet that cholecystostomy will be more popular than cholecystectomy. This statement is particularly true as to those surgeons who have a mixed, i. e., both acute and chronic service.

Cholecystostomy will be more popular just as long as the principle of drainage in inflammation is the ideal surgical principle.

There is no doubt that cholecystectomy is an ideal operation in some conditions, notably chronic empyema, primary carcinoma, shrunken fibrous gall-bladder, hydrops, gross injury to the cystic ducts and gall-bladder by stones or injuries incurred in the removal of stones. But many surgeons of international repute remove gall-bladders, where equally as noted men perform cholecystostomy.

Both sides back their procedures by such strong arguments, that it is evident that each one of us must decide just which procedure should be adopted for himself.

Let us remember that cholecystectomy is a serious operation and that cholecystostomy is so slight an operation that one surgeon (McArthur) has used it as a therapeutic fistula in his gastric surgery.

Personally I think that the pendulum does swing toward cholecystectomy, but will surely reverse after the popularity of cholecystectomies has worn off. My reasons are:

First: Stones seldom reform after cholecystostomy. The Mayos claim only a single case in which stones reformed out of 1200 cholecystostomies.

2nd: There are many recurrences after cholecystectomy.

3rd: Some remove the gall-bladder on the assumption that it is the only seat of stone formation and that the stone formation is due to an inflammation of the gall-bladder. Gall-stones are not invariably formed in the gall-bladder nor are they invariably the result of an infected gall-bladder, since over 50% of cases with gallstones, have sterile gall-bladders (Rovsing).

4th: It is unsurgical It is overstepping surgical bounds to remove organs that have a function since, unlike the appendix, the gall-bladder is not a rudimentary organ. This is demonstrated by the fact that nature tries often to reform a gall-bladder from the stump of the duct left in cholecystectomy, and the fact that bile is half as irritating to the pancreas, if it come from the gall-bladder as bile coming from the liver.

5th: The facilities of the average surgeon, unlike the facilities of the various group clinics, do not facilitate observation and study of all cases to the same extent, nor are we all as skilled pathologists. Therefore we are apt to remove the wrong organ to ameliorate certain borderline conditions which is more serious than if we had just drained the gall-bladder.

6th: The best pathologists will in a certain number of cases overlook cholangitis, stones and pancreatitis.

7th: Many of the best men claim a higher mortality for cholecystectomy than for cholecystostomy. Out of 45 surgeons of note, 21 claim a higher mortality for cholecystectomy (Guthrie). Bevan claims twice the mortality for the former.

8th: The mortality in cholecystostomy can often

be obviated by additional procedures, whereas in cholecystectomy the patient sometimes dies with severe vomiting and retching after the operation before one has a chance to interfere. Critical states of the patient, post-operative hemorrhage and insufficient drainage from a cholangitis or pancreatitis often obvious and serious conditions, that will be overlooked by the best men and more frequently by the average man, will be responsible for rapid demise after cholecystectomy. One may ask, how about choledochotomy, if necessary, after cholecystectomy. This is not a practical question, because when your patient is exhausted from a cholecystectomy and vomiting, choledochotomy means almost sure death. Choledochotomy is a difficult operation, leading to scar formation and yet if not performed in remaining post-operative cholangitis, pancreatitis or local hepatitis, it would mean that we expect drainage through the tiny papilla of Vater, two and one-half m. m. in diameter. Opie points out that the drainage may have to depend upon the accessory duct of Santorini. This argument appears to be only theoretical in cases of severe inflammation.

10th: The argument that a second operation may have to be performed, after cholecystostomy, does not hold water when we recall the Mayo statistics quoted, and when we remember that cholecystectomy is a more dangerous operation and that two safe operations are far better than one dangerous one. If in doubt, the patient himself would always decide for two operations, had he the choice. As Beaver puts it: A living patient with a gall-bladder, is better than a dead patient with no gall-bladder.

SUMMARY. 1: There are more gall-stone affections than we suspect, as demonstrated by systematic examination of the gall-bladder during operations.

2: Streptococci are probably the most frequent primary causes of gall-bladder infection, since we harbor the germ in such common diseases as tonsilitis and other sore-throats.

3: Irregular dyspepsia is the most common mode of manifestation of gall-bladder disturbance.

4: In doubtful cases of prolonged dyspepsia one is justified in exploring the gall-bladder after ptosis and other conditions have been excluded.

5: Some operations could be avoided in inoperable cancer of the liver, if we would remember that jaundice, if severe and persistent is usually not gall-bladder jaundice and that loss of weight is either due to food intolerance or the cachexia of cancer.

6: There is a great percentage of primary cancer of the biliary tract to be avoided by removing stones, more frequently than is done now.

7: Gall-bladder trouble is a surgical malady.

8: Not all gall-bladders that have stones are infected; 50% are not.

9: Undoubtedly many recurrences can be avoided by removing all stones in the ducts at primary operation; the gall-bladder is not the only seat of their formation.

10: The issue of cholecystectomy *versus* cholecystostomy will most likely result in a better standardization of the two operations, but cholecystostomy will remain the safer and more frequent operation.

63 W. SECOND STREET.

ADHESIONS IN THE REGION OF THE DUODENUM.

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The adhesive bands between the stomach or duodenum and the liver or gall bladder, are, in our experience, of two kinds:

1. Those of a distinct inflammatory nature with a very evident etiology.

2. A class which exists without any other pathological condition in the vicinity. Membranes and bands of various degrees of strength and extent, which are non-inflammatory in appearance, and resemble altered peritoneum. It is this latter type which we shall discuss.

Soon after the publication of Lane's ideas with regard to intestinal stasis, Seton S. Pringle, Mr. Gray and several others described these bands in considering the whole intestinal tract. M. L. Harris has regarded this condition as an entity, and it is because we think the subject is deserving of such consideration, that this discussion is undertaken.

ETIOLOGY.

Much evidence has been given of the congenital origin of these bands. We believe, however, that they are in the majority, non-inflammatory fibroses as described by Adami. It was not until we studied his ideas on the subject, that we felt that we had a true explanation of this peculiar condition. He has clearly described how bacteria pass through the intestinal wall, where they are generally killed before multiplication and active inflammation. The death of the micröorganisms produces toxins which cause alteration or death of the tissue cells, with which it comes in contact. This process, with its subsequent substitution of fibrous tissue for that destroyed, when occurring between opposing surfaces, as the duodenum, the gall bladder, may cause them to ad-

here. Later any "stress" or pulling on the bowel, will cause lengthening and strengthening of the adhesive band. Admitting the possible existence of congenital bands, we believe them to be the seat of further fibrous change. We have seen them in what seems to be the various stages of development, from thin spider web structures to firm strong membranes. Sometimes portions of the same band, show a further stage of development. In operating in other areas of the abdomen, very weak and easily separable bands were discovered by manual exploration, which had not yet caused constriction, and had given rise to no symptoms.

Before taking up the symptoms, we present a few illustrative case records.

CASE I. Mary L. S., age 21, single, nurse. Family History: Negative.

Subjective Symptoms: Patient never had any serious illness. Two years ago had an attack of pain in the epigastrium, and inner right costal margin. Since then the present condition has existed. Paroxysmal distress in the region of the gall bladder, reflected to left nipple, and sometimes around to right costal margin. This causes nausea and sometimes vomiting. Intervals of attack bear no relation to meals. Does not desire food during an attack and never partakes of pastry or "heavy food." Constipation.

Examination: Liver and stomach normal in size and location. Extreme tenderness over pylorus and gall bladder. Blood and kidneys normal.

Gastric Examination: Hyperchlorhydria.

Pathological Anatomy seen at Operation, February, 1913: Very dense fibrous adhesions, between liver and pylorus, involving a perfectly healthy gall bladder. Slight gastroptosis. Uterus and adnexa normal. Appendix normal.

Operation: Complete separation of fibrous bands with knife, freeing liver, gall bladder, and pylorus.

Post Operative, November, 1916: Patient well and entirely cured of her past symptoms.

CASE II. Sarah B., age 50, widow. Family History: Not significant. Healthy childhood.

Subjective Symptoms: Always well with the exception of having attacks of stomach trouble for past fifteen years. At present has distress in epigastrium, more severe after eating. This occurs periodically, especially after eating large meals. When stomach is empty, it is more of a dull ache. During attacks she vomits. No blood. Aching sensation is reflected to scapula. Constipated.

Examination: Liver normal, slight tenderness over gall bladder. Tenderness in epigastrium.

Gastric Analysis: Negative, excepting hyperchlorhydria.

Pathological Anatomy seen at Operation, March 10, 1914: Stomach large with ptosis. Gall bladder normal. Adhesions between liver, gall bladder and pylorus thick and very firm. Abdomen and pelvis normal.

Operation: Separation of adhesions by knife, between and around stomach, liver and gall bladder

Post Operative, September, 1916: Patient well with no return of former symptoms.

CASE III. Joseph S., age 26, single; railroader. Family History: Negative.

Past and Subjective: Patient never sick. For past two years has complained of distress and soreness in stomach. Cannot eat solid food on account of producing above symptoms. Between meals aching occurs, or rather pressure sensitiveness. Pain and vomiting after heavy meal. Constipated. Treated constantly for past two years, with no relief. Loss in weight.

Examination: Liver normal, location and size, stomach dilated. Extreme soreness over stomach and causing pain by producing traction. Sensitive in region of the gall bladder.

Gastric Examination: Hyperchlorhydria. Blood and kidneys normal.

Pathological Anatomy seen at Operation, November, 1915: Very thick, dense adhesions connecting under surface of liver to pylorus and extending to duodenum. Appendix normal. Abdomen normal.

Operation: Complete separation of union releasing liver, pylorus, and duodenum by means of knife.

Post Operative, November, 1916: Patient is in perfect health, gained 26 pounds in weight, and is completely relieved of all former symptoms.

CASE IV. Arthur W., age 31; special representative. Family History: Negative.

Subjective Symptoms: For past ten years has had symptoms referable to stomach and liver. Frequently would complain of "bilious" attacks, a constant sensation of uneasiness in the region of the gall bladder and duodenum, pressure here causing soreness, which was aggravated by eating heartily. Two months previous to operation, complained of soreness in the region of the liver, slightly jaundiced, and unable to partake of food, because of the resultant distress. "Heart burn" was a common symptom. Loss in weight. Constipated.

Examination: Liver enlarged, stomach somewhat enlarged; extreme soreness over liver and duodenal regions; pain experienced upon traction of the stomach.

Gastric Examination: Hyperchlorhydria.

Blood and kidneys normal.

Pathological Anatomy seen at Operation, March 2, 1915: The liver enlarged, the under surface firmly adherent to the duodenum by a thick, dense band. Chronic congestion of liver. No evidence of previous inflammation.

Operation: Complete division of union, releasing liver and duodenum, by means of knife.

Post Operative, November, 1916: Patient is in perfect health, having gained 32 pounds in weight, and is completely relieved of all former symptoms.

From these cases it will be seen, as reported by others, that their extent varies from that of a short band between the gall bladder and nearest portion of the duodenum, to a broad band involving the pylorus, duodenum, gall tract, and transverse colon. Certain signs and symptoms were present in

all of our cases. Some were dependent upon the exact area involved.

Common symptoms: 1. Chronic constipation. This is always among the first things noted by the patient, and often the only symptom present for several years. Later there comes occasional desire to defecate at times, immediately following what should have been a satisfactory evacuation. This is very distressing, and we believe it is due to the reflex stimulation, by the distended duodenum and stomach, of the illeo-cecal valve which causes its premature opening, as demonstrated by Hertz.

3. Sensation of fullness and weight in the upper abdomen which, in cases of long standing, finally amounts to a dull ache, occurring at no definite time between meals. It is more pronounced after a full meal of solid foods.

4. Gas eructations. Longer-standing cases have eructation of sour fluid.

5. Nausea without vomiting.

6. Underweight.

7. Neurotic temperament, with frequent headache and dizziness.

8. Hyperchlorhydria. Usually very pronounced.

9. Appetite remains good.

We think this very characteristic in combination with the other symptoms.

Special symptoms: When the gall tract is constricted, or the region of the duodenum into which the end of the common duct empties is involved, there are:

1. Occasional slight jaundice.

2. Pain resembling gall-stone collic but never very prolonged or severe, and easily relieved.

These cases were usually young active persons of either sex, and almost without exception, they had a muscular abdominal wall, although most of them had habitus enteropticus. Many, though not all, have a "dull pulling pain" as they often say, when deep pressure is made in the midline of the abdomen, just above the umbilicus. The Roentgengrapher, can of course, demonstrate the distended duodenum and stomach when it exists.

The differential diagnosis of this condition is being made the subject of further study. However, we can say that these cases are never acute in any sense. The symptoms are at first easily relieved by appropriate medical and dietetic care, but they recur promptly on ceasing treatment. The course of discomfort is always progresively worse. These cases are almost always referred with a diagnosis of ulcer, or gall stones, and most of the first cases observed by us were operated upon with a tentative diagnosis of either one or the other of these conditions.

Prognosis: However divergent the opinions of writers concerning the etiology of this condition, they all seem to agree that when the bands are causing constriction, they may finally give rise to the formation of gall stones, duodenal and gastric ulcer, and abscess. We have seen several cases of this kind where the bands were present, and did not seem to be inflammatory at all. In a purely mechanical way, the blood and nerve supply of the stomach, duodenum and gall bladder is altered, giving rise to a wall of lowered resistance and altered structure in certain areas. The constriction of the lumen of the bowel, and the altered motility cause weakening of musculature, retention of irritating gastric contents and hyperacidity. This constant approximation of irritant and lowered resistance is easily productive of the sequelæ mentioned above.

Treatment: It is evident that the medical treatment is only palliative, and if prolonged, it only subjects the patient to dangerous end—results. The operation of this condition is technically one of the simplest, and the risk is slight. If the bands are cut and not torn, there is no recurrence in our experience, and the results from the patient's standpoint, are the most satisfactory.

In conclusion, we would add that if some part of this discussion seems to be a repetition of previously stated facts, we deem such repetition to be justified by the seeming lack of appreciation of these facts by many physicians even now. Most of the cases we have seen have had their faith sorely tried by years of experience with pills, powders, and potions of all kinds, until they welcome an operation for the sake of variety, if for no other reason.

When this group of symptoms presents itself to the physician he will gain much honor in his own country by calling in his friend the surgeon.

800 KEENAN BUILDING.

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The Army and Navy need more doctors—lots of them! Have you offered your services?

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THE NON-ENUCLEATION SURGICAL TREATMENT OF CERTAIN FORMS OF PROSTATITIS.

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Now and then we encounter an old prostatic condition which causes the patient much annoyance. We do not necessarily find such a pathological prostate in the aged. The prostates that we find in these advanced males are generally easily enucleated by the two-stage method. This class of prostates is not hard to deal with, for as a rule they have the typical hypertrophied outer coat previously known as the capsule but more recently found to be merely an altered part of the gland itself. It is not with this class of gland that I shall deal.

There is, however, a type of prostate possibly not as frequently seen as the cirrhotic type, which is recognized by three pronounced signs: there is the hang-over morning leakage from the urethra, some interference with micturition, a disagreeable irritated feeling about the neck of the bladder and referred to the glans penis.

Thus it will be seen that we have two distinct types of pathological prostates. On the one hand is the cirrhotic type, with which I shall not deal, and on the other, the soft, spongy, infected and infective type of diseased prostate, which is the one we are to consider here.

For several years I dealt with this latter type of prostate in a rather cumbersome manner. No operative treatment had been brought forward, and we were not able to do anything except to give urinary antiseptics, some massage by rectum, and instruct the patient as to hygiene, sexual habits, diet, care of the skin, etc.

So far as my own observations were concerned I was not satisfied with the results obtained. Repeated urinary tests showed considerable pus, some blood, mucus, and detritus including desquammation. I endeavored to clear up this urinary condition by regular massage of the gland. For a time it would seem to improve, but any let-up in the massage produced a remission, although in the majority of cases the urethra was clear.

As bladder irrigations did not seem to do any good, and pus and blood persisted in the urine, I thought that if in some way that relatively young prostate could be drained, a cure could be effected just as in other parts of the body. The next problem was just how to produce this drainage. The macroscopical pathology of the prostate was carefully studied. In every case the gland was found to be soft and pliable. Now and then a case would be seen where characteristic, small, hard nodules were felt. This type seemed to be a border-line condition, just within permanent establishment of the cirrhosis stage. To prevent this gland from entering the cirrhotic stage would mean much to the patient. With this end in view, I made a careful microscopic study of the normal, as well as the pathological prostate, making liberal use of all the text dealing with this subject. This was the underpinning for the surgical procedure to help these patients.

HISTOLOGY.

The prostate is a compound, branched, tubulo-alveolar gland. The external layer is made up of dense layers of non-striated muscle fibres, connective tissue and yellow elastic fibres. Processes and lamellæ composed of all these elements extend into the interior of the gland, converging towards the base of the colliculus seminalis. Between the larger of these trabeculæ are located numerous glands which consist of good-sized, irregular alveoli, separated by a fibromuscular septum and trabeculæ. The alveoli of these glandular constructions are lined by simple columnar epithelium and Walker has shown that a delicate basement membrane is present in the form of very fine connective tissue threads. All of these excretory ducts, lined by this simple columnar epithelium, sooner or later become confluent, thus forming numerous collecting ducts, which empty into either the colliculus seminalis or the sulcus prostaticus. Near their termination we find transitional epithelium similar to that lining the first portion of the urethra.

This brief review of the histological appearance of the prostate gland will suffice for the foundation upon which we can build the changes that might and do occur in a diseased prostate.

PATHOLOGY.

In dealing with a pathological prostate gland the important things are the outer covering and the alveoli.

In former years the outer covering of the prostate was supposed to consist of a well-defined capsule. Zukerkandl by his ingenuity has proved that no real capsule covers the prostate. What was formerly termed the capsule is simply the hypertrophic condition of the dense layers of non-striated muscle fibers, connective tissue and yellow elastic fibers forming the periphery of the normal gland. If the brief histological review is studied, it will be plainly seen that this is true since much of this

tissue extends well into the interior of the gland. If it were a physiological entity, we would not find the "capsule" extend into these inner parts. Since dissections are made easy by the hypertrophy of this outer formation, it simply suggests that fibers of the same character have multiplied to such an extent that crowding has taken place and the gland is more readily moulded from its bed. Therefore we can agree with Zukerkandl and consider that the pathology is hypertrophy brought about by disease.

Further we must consider the pathology of the alveoli. The simple columnar epithelium become more or less flattened by the influence of infection. The excretory function is depreciated and there develops a condition which might be termed pathological retention. This in itself produced further crowding and influences the outer coat to greater hypertrophy in order to keep from bursting. We find in subacute and chronic prostatitis the varying stages of a thickened periphery. This thickened and hardened condition of the outer coat of the gland permits the entire mass to become well defined from other structures and to be quite easily separated, especially in the older, chronic forms.

TREATMENT.

These prostatic cases cannot be properly treated without definite knowledge of the foregone pathology. If we consider the treatment from this viewpoint, there are two methods:

Method No. 1: Here are placed all of the chronically sclerotic prostates. Whether the gland is of this type can be readily determined by digital rectal examination.

All of the chronic, sclerotic forms can be best treated by the two-stage enucleation method of Willis, with which all are familiar.

Method No. 2: Under this method is placed the subacute type of semi-soft prostatic disease which is neither amenable to, nor in proper pathological state for, the two-step enucleation method. It is the soft, large, pulpy feeling gland that is amenable to the treatment of this method, which cannot be enucleated en masse. Morcellation cannot be completely accomplished and when it is attempted the destruction of urethral and cystic tissue gives poor after-results, for the cicatrical tissue which forms of necessity is a bar to good results. Again it is this large soft or semi-soft gland that gives much pain, discomfort, interference with micturition, retention, obstruction and melancholy. These symptoms wear upon the patient and he becomes a wreck. These conditions can be determined by digital examination per rectum.

Just what to do with these cases was to me a problem, but after much consideration and observation the following course was decided upon:

The patient enters the hospital and for three days previous to the operation he is given some standard urinary antiseptic and plenty of water, and is kept quiet in bed. A liberal, meat-free diet is given and the bowels are kept open. On the fourth day suprapubic cystotomy is performed. Sometimes under local and sometimes under general anesthesia. The usual routine method of Willis is carefully followed, and the gaping bladder is stitched to the abdominal wall, which takes but a few moments. For the following three days the patient is given liquids for nourishment, and water very freely. The urinary antiseptic is continued with smaller doses of quinine sulphate. On the fourth day after operation hot boric acid solution irrigations are begun. This irrigation is accomplished through both catheters, namely, one enterng the bladder by the urethra, and one entering by the supra-pubic incision. Every day for two weeks this irrigation is continued until the draining fluid is clear. During this period the patient is returned to general house diet, and large quantities of water are administered. The patient is permitted to be up and about and to enjoy a moderate amount of exercise. A general tonic is usually given also.

While watching a goodly number of these cases under this technique I was gratified to learn that satisfactory results were forthcoming. The prostate gland would decrease to normal size and shape; the urine would become clear and all the pathological signs and symptoms would disappear. At the end of two weeks the catheters were withdrawn and the small supra-pubic aperture would close very quickly and the patients were discharged in perfect health.

Following are some of the cases treated in this manner:

CASE I. M. M. H., 32, single, shoe-tacker.

Family History, Unimportant.

Past History: Has had 3 attacks of gonorrhea; last attack two years ago. Since these, continuous, watery discharge from urethra. Occasional attack of acute retention necessitating the use of the catheter. Between the attacks of retention he finds difficulty in starting the stream and dribbling. Some burning and smarting at the start and finish.

Physical Examination: Other organs, negative. *Local*: Meatus reveals slight, thin, cloudy, watery discharge. Smear and culture of this discharge showed no organisms. Three-glass urinary specimen showed shreds in all with cloudy urine. Digital examination per rectum revealed a large, soft prostate of even outline. Blood examination, negative. Wassermann reaction, negative.

Diagnosis: Chronic infiltrative prostatitis, secondary to recurrent gonorrhea.

Treatment: July 12, 1915 entered Nôtre Dame Hospital for treatment. Usual three-day preparation.

July 15, 1915. Supra-pubic cystotomy, under analgesia and amnesia. Three days after the operation daily bladder two-way irrigations were begun and continued for eight days, or until the drainage and irrigation had been clear for three days. Eighth day pubic catheter withdrawn and patient allowed up and about. Eleventh day urethral catheter withdrawn and voiding permitted. Fourteenth day discharged from the hospital. At this time the urine was perfectly clear and free from shreds by the four-glass method. General hygienic, dietetic and advisory principles outlined.

August 8, 1915. Four-glass tests made with negative results. At this time the stream was full; no difficulty of micturition. He felt well and vigorous and has remained so since.

CASE II. M. J., referred by Dr. Kelso of Hillsboro, single, 51, farmer.

Family History: Unimportant.

Past History: Negative except for gonorrhea ten years ago.

Present Illness: Past five years thin, watery discharge from urethra.

Physical Examination: Other organs, negative. Old deformity of left hip. Local examination showed thin, watery discharge from urethra. Prostate, the size of a small orange, soft and regular in outline. No stricture. Smear of discharge revealed no organisms. Urine: four-glass specimen showed shreds in the first two, the last two clear. Albumin, sl. trace. Sediment,—shreds of mucus, leucocytes.

Diagnosis: Sub-acute infiltrative prostatitis.

Treatment:

May 5, 1915, entered Nôtre Dame Hospital. Usual three-day urinary antiseptic treatment.

May 8, 1915, supra-pubic cystotomy and establishment of two way drainage. Three days later irrigation begun. Eighth day pubic catheter withdrawn. At this time patient was up and about and urine clear. Discharged on the 14th day with clear urine, prostate of normal size, firm and regular in contour, stream easy and full, no pain.

May 24, 1916, one year after operation, patient in perfect health with normal prostate and genito-urinary system in good condition. Four-glass specimen showed all urine clear.

Patient feels in perfect health and has just returned from a winter spent in the South.

CASE III. M. S., Concord, N. H., 41, single, store-keeper.

Family History: Unimportant.

Past History: Repeated attacks of gonorrhea. Lues 3 years ago.

Present Illness: Past three years thin, watery urethral discharge. Some difficulty of micturition. slow in starting and dribbling. At times severe burning during the entire course.

Physical Examination: Copper spots over entire body surface. Heart and lungs, neg. Abdomen, neg. Sub-occipital, sub-mental, epitrochlear and inguinal glands enlarged. No ascites or edema. Reflexes normal, except suggestion of slight exaggeration of knee-jerks.

Local Examination: Thin, pale, watery discharge from urethra. Glands present on dorsum of penis. Four-glass specimen of urine showed shreds in all with cloudy urine. Prostate the size of an orange, soft, regular and tender. Smear of discharge revealed no organisms. Blood,—Wassermann reaction positive, Hgbn., 70% W. B. C. 15,400; R. B. S. 3,700,000. Def. Ct. Poly. 80, S. M. 15, L. M. 5. Urine-cloudy, shreds, sp. gr. 1026, acid, trace of albumin; no sugar; sediment, shreds of mucus and leucocytes with bladder epithelium.

Diagnosis: Sub-acute infiltrative prostatitis; lues.

Treatment: August 20, 1916 entered Nôtre Dame Hospital. Usual three-day urinary antiseptic treatment. August 23, 1916, supra-pubic cystotomy and establishment of two-way drainage. Three days later irrigation begun.

Eighth day, pubic catheter withdrawn. Twelfth day, urethral catheter withdrawn. Patient up and about since seventh day. Discharged on the fourteenth day with clear urine and micturition normal. Prostate well contracted, of normal size, and regular in contour. Says he feels better than for ten years past.

October 5, 1916. Reports in fine condition. Examination shows urethra normal and prostate normal in size, consistency and contour.

Note: After recovering from the operation antiluetic treatment was given. November 15, 1916, Wassermann reaction negative.

CASE IV. (Referred by Dr. Kelso of Hillsboro). Mr. S., 34, mill operator.

Family History: Unimportant.

Past History: Gonorrhea 18 months ago. Persistent watery urethral discharge for the past year. Burning micturition during the entire course. Dribbling.

Physical Examination: Other organs, negative. Thin, watery discharge from meatus. Dr. Miller reports stricture in prostatic urethra. Prostate the size of an orange, soft, regular in contour. Smear of discharge revealed no organisms. Urine, —four-glass specimen showed shreds in all with cloudy urine, acid, sp. gr. 1026, trace of albumin, no sugar; sediment, shreds of mucus, pus cells, occasional red blood cell with crenation, bladder spithelium. Blood, Wassermann, reaction, negative, cystology, normal.

Diagnosis: Sub-acute infiltrative prostatitis.

Treatment: November 7, 1916, entered Nôtre Dame Hospital. After three-day urinary antiseptic treatment, on supra-pubic cystotomy, establishment of two way drainage. Divulsion of urethra. Three days later irrigation begun. On the 8th day pubic catheter withdrawn. Up and about. 11th day, urethral catheter withdrawn. 14th day, discharged. At this time urine clear by four-glass method. Micturition painless, stream normal, prostate well contracted, normal in size and contour. Says he feels better than for five years. Referred back to Dr. Kelso.

Seven selected cases have been operated on under this method, and in each instance the result has been most satisfactory. The melancholia so prevalent among this class of patients, disappears. They assume an attitude of contentment and well-being. The prostate early becomes normal in size, the urethral discharge ceases and there is comfortable and normal micturition.

It certainly seems that such results warrant a continuation of this plan of treatment. It ought to do much to help the old urethral discharge cases.

These cases should be well selected and a most careful and painstaking pre-operative examination made.

967 ELM STREET.

PERSONAL OBSERVATIONS OF THE CARE OF THE WOUNDED IN THE GREAT EUROPEAN WAR.*

R. C. BRYAN, M.D., F.A.C.S.,
RICHMOND, VA.

In an article, "The Surgical Care of Wounds in the European War," read at the forty-seventh annual meeting of the Medical Society of Virginia, October 24, 1916, I attempted to incorporate in the time allowed the experiences which I gathered from a rather active surgical service of four months' stay, about thirty miles back from the front at Juilly, during the summer of 1916. It is obviously impossible to record the many interesting phenomena arising from such an experience. Pathology is the same the world over, but etiology of the pathologic state differs. The one essential causative factor of the surgical cases we had was, gunshot wounds, or some manifestation of suddenly arrested momentum. It is not my desire to present to your attention the theory of ballistics, the trajectory of bullets, the foot pounds they possess, the heat they develop, nor the ricocheting and freak courses that they at times pursue. Nor is it my intention to consider the individual patient, his social condition, age, or character of work, or whether he had been injured by hand grenade, rifle ball, shrapnel ball, fragment of shrapnel shell, torpedo, foreign body, bayonet thrust, or with the high explosive shell. We are to consider that soldier only who presents for investigation and treatment some injury as the result of a penetrating foreign body, whether it be a simple wound or a compound, comminuted fracture with destructive lesions of the soft parts, in each instance practically always previously infected, and who comes under our observation some four or five days after the receipt of the injury. At the many hospitals which I had the privilege of visiting during my stay near the battle front, I saw as many different modes of treatment, each and all designed to combat infection which varied in degree and character, and which was evident as the result of great traumatic violence.

Some of the many means of treatment which I saw in use were, numerous small bags of salt laid upon the wound, probably to encourage osmosis, different preparations, of phenol, iodine, mercury, bichloride, gentian violet, methylene blue, Menciere's solution which has iodoform for its base, Sir Almoth Wright's solution, citrate of soda, magnesium sulphate, which we used only in Hospital B, hypertonic salt solution, and Dakin's solution which has been perfected into surgical technic by Dr. Alexis Carrel.

In an article appearing in the *Journal of the A. M. A.*, January 13, 1917, H. M. Lyle, of New York, elaborates freely about the properties and virtues of this solution, and I earnestly commend it to your surgical consideration. In this treatise the preparation of Dakin's solution, of the tubes, and irrigating tubes and can, is freely discussed, the technic of the introduction of these tubes, covered with turkish toweling, into the wounds is also taken up, as is the protection of the skin, the bacteriological control of the wound, the toilet of the wound, bone involvement, nerve-lesions, etc., which must come into consideration in the constant use of a solution designed to mathematically asepticise an intensely infected surface. This article is so complete and comprehensive in every detail that I shall not attempt to contribute any further surgical literature on the subject, particularly in the allotted time allowance, but shall devote my opportunities, as the title of my paper signifies, only to some rather disconnected personal observations of some of the few surgical features of this greatest of human conflicts.

I had the pleasure of spending one day at Chateau d' Anel with Dr. Lyle, and it happened on that occasion that Dr. Carrel, who was present, expressed himself freely that he considered from every standpoint that the question of sterilization of wounds was perfected, so much so that he proposed to abandon any further consideration of the question, development of technic, or changing the strength of the fluid. He believed that in Dakin's solution, with a daily microscopical investigation of the pus, the question of wound sterilization had been solved. Further that his hospital at Compeigne, but a few miles from the front, was to be abandoned and he and his assistants were to go to the front to work with Deage at Lepin, where they

* Read at the 19th Annual Session of the Tri-State Medical Association, Durham, N. C., February 21, 1917.

were to devote their entire time and energy to the consideration of shock.

I had the opportunity of visiting Carrel's hospital, Rond Royal, at Compeigne, the next day. I spent a day at this hospital. Carrel does not operate now, but Dr. Dehelly, the right hand man and operating surgeon, very kindly took us over the entire building, describing in detail the treatment of the cases from the time they are received, usually a few hours after the receipt of the injury, to the day of their departure. I saw cases in the varying stages of healing. I saw one case in which the wound loss was so great that twenty-five tubes were being used. I saw compound, comminuted fractures of the thigh immobilized in appropriate splints being bathed continuously by Dakin's solution. I saw the ultimate movable, soft, healthy scar resulting from a clean cicatrization. I saw a patient who had a compound, comminuted fracture of the thigh walking on the 44th day, with perfect union and a healthy wound. I saw extensive burns of the face, neck and hands from gasoline explosions in aeroplanes, and burns from the back-fire of sappers, soft, plastic and normal in six days after the receipt of the injury. I was shown by the courtesy of Dr. Dehelly color photographs, taken in a most delicate and artistic way, of the various stages of progressive healing and cicatrization of every character of wound from the small superficial injury to the large devastating wounds involving the entire shoulder girdle, characterized by extensive bone destruction and involvement of the soft parts. This progressive daily repair was most carefully noted, and the astonishing daily progress was unmistakably noticeable by this recorded photographic system. The outcome was so bewildering, incomprehensible and at variance with all our previous surgical ideas of wound-sterilization and restoration, that Dr. Hawley, of Bridgeport, Conn., and myself who were witnessing this incontestable illustration of the last word in surgical skill, were at a loss to say anything, or even to discuss what we had seen.

One interesting feature, which had been brought out by one of Dr. Carrel's assistants at Compeign, was a mathematical formula, something like Ambard's coefficient for urea excretion, by means of which the computation of the rate of repair of the wound could be accurately foretold, and the day on which the wound would heal could be accurately figured out. The principle of the formula is based on the number of square centimeters of tissue-loss which the soldier has sustained. The depth of the wound, the character and location, bone involvement, or injuries to the soft parts have no influence upon the reckonings, and every wound is treated in the same way.

It is interesting to note that there is no skin grafting done upon the large raw surfaces. Although grafting at first would apparently hasten recovery, by this mathematical equation it has been demonstrated to delay repair, so that the surgeons have found out by experience that the application of skin was unnecessary and in every instance was contraindicated.

Since my return there has been a new treatment brought out for burns which has received considerable attention. I refer to that paraffine or waxy product called "Ambrine." This looks like a cake of cocoa, about the same shape and size, and a little lighter in color. A block is cut off (as much as is desired), put in a closed vessel and then placed in a water-bath and the heat continued until the wax is well-melted. It is then poured, or better sprayed, upon the surface. It soon cools and immediately forms a thorough protectant which adheres gently, is not disturbed by the movement of the parts, or the wrinkling of the tissue, excludes the air and exercises continuously its beneficent medical influence upon the raw surface.

I believe this preparation was first developed by Dr. Barthe de Sandforth, who states that he has been working for some twenty years in perfecting this medication, and has been able to teach only one other man how to prepare it satisfactorily. The temperature at which it may be applied is 158° Fahr., which paradoxically on the burned, raw surface gives no pain, but may cause considerable discomfort when dropped upon the normal skin. It is essential at all times that there be no water upon the surface upon which this paraffine preparation is to be applied. For this reason after the wound has been nicely cleansed and the pus removed by irrigation, the wound is thoroughly dried by means of an electric hot-air drier and the surface is then ready for the application of the wax. While it is still hot strips of thin cotton batting are put over the wax, the ambrine is again sprayed on the batting and more cotton is put on, and the whole is kept in place with a loosely applied bandage. This air exclusion treatment is certainly at variance with some of our former treatments of extensive burns, particularly that form in which the parts were exposed to the open air so that in the entire process of granulation no covering or dressing comes in direct contact with the burned surface. Many of us who have had the opportunity to treat burns in this old way recall the cicatrization and suppuration by the open air treatment so that I venture to say we will be glad to know about a treatment which claims

to do away with cicatricial formation and consequent deformity. Apparently, then, this is the ideal method of the treatment of burns of a lesser degree of superficial excoriations and lacerations. Those severe burns of the deeper structures, infected, with considerable tissue loss, and certainly those in which the bone is involved, should be treated only by the Carrel solution. I have had the opportunity to use ambrine but once since my return, on a very small superficial burn, and it worked well, so I am not in a position to say from personal experience anything of its value in deep burns up to the third degree.

I had the opportunity during the last summer to use La Clainche and Vallee's serum, which is of a polyvalent character designed particularly for use in those distressing cases of compound, comminuted fractures in which the fragmentation has been of the severest character, in which the infection is profound and mixed, and which do not respond to the usual methods of antiseptic applications, or irrigations. This treatment had been in use before the development of the Carrel technic. I remember one case in which a shrapnel ball entered the posterior aspect of the thigh, traversed the head of the femur and emerged anteriorly, shattering the bone completely; many small spicules of bone were coming away for weeks, sinuses established themselves; there was a low degree of sepsis constantly present. Use of this serum in this particular instance was certainly of benefit. A few drops of the solution is put upon a wick of gauze which is gently packed into the suppurating sinus, or sinuses, and removed daily. When a new application is carried out, the wound may be irrigated with a saline solution if suppurating very freely. Apparently, however, the simple application of the polyvalent serum with no irrigation is preferable. No significance is attached to the character of the germ present, the multiform constituents of the serum being designed to combat every form of germ so that microscopical controls are not necessary.

The sickening, devastating wounds of the face, with loss of one-half or more of the organs of special sense, were not treated at our hospital but were sent to appropriate institutions in Paris where surgeons, trained in plastic surgery, by a series of operations restored in a most wonderful way this loss of substance. Not only were photographs taken at the time of the operation, but also to show the daily progress of the wound, and in many instances wax models in lifelike coloring were accurately modeled to show just the extent and character of the wound and its varying stages of repair. At Val de Grace, one of the larger municipal hospitals of Paris, the wing of one ward is given up to this cosmetic repair work, and it is here that Dr. Morestin accomplished wonderful results in plastic surgery. Also at the American Ambulance A, Neuilly, they have been peculiarly successful in this class of work, and it has been my fortune to see cases in reparation there which had been operated on by Dr. Jos. P. Hutchinson and Dr. Chas. A. Powers. There is certainly no class of injury that taxes the skill and ingenuity of the well equipped surgeon such as this variety of horrible mutilations.

It is not my intention to dwell upon shell shock, nervous diseases, or medical cases which arise from the constant strain, or improper life in the trenches. Hospitals designed for these diseases, are scattered generously over France. I believe 8,000 are now extant, many private homes, hotels and chateaus having been requisitioned. I understand that Menier, the chocolate king, has given his handsome chateau for those who have lost both arms and both legs. There were 80 of these human trunks there at one time. At the Hospital Reuilly, in the heart of Paris, they have some 300 blind soldiers who are starting life afresh in learning trades, carpet-weaving, basket-making, manufacture of buckets, tubs, barrels, repairing automobiles, even the manufacture of carburettors, which I learn require 34 separate parts, piano tuning, instrument making, etc. There was a hush and silence in the different mechanical halls among the working men, which was oppressive; and to those who are not accustomed to seeing men grope about in the broad daylight to find by sense of touch only what they were looking for, was as unique as it was sad and depressing.

The spirit that actuates the French is one of resolution and determination; the heartless destruction of their homes and land has been checked. Warfare is no longer "on" the ground, but below, and above the ground. To make substantial gains and dislodge the enemy can be attained only by supreme efforts and great sacrifice. It is a war of attrition, and in the grinding away the smaller body will give out first, but when? No one, I venture to say, can accurately predict.

Have you interested the young physicians in your community, fresh from the hospital, in the imminent need of medical officers for the army and the navy?

A HERNIOPLASTY RETRACTOR*.

CARL R. STEINKE, M. D.

Visiting Surgeon to The Akron City Hospital; Formerly Instructor in Surgery, University of Pennsylvania School of Medicine.

AKRON, OHIO.

The retractor herein described has proven to be a valuable adjunct in the performance of hernioplasty.

Figure 1 illustrates the retractor closed and fully open. A and A′ are set screws preventing any slipping of the sides after pulling out and setting in position. B and B′ are cord retainers over which the spermatic cord is placed while the tips are approximated, after which the tips are separated, thus drawing the cord taut (figs. 2 and 3). C and D represent the extreme positions at which B and B′, respectively, may be placed. This retractor can be used well in the Fergusson, Bassini or Halsted technic for inguinal hernia, Ruggi's inguinal approach for the radical cure of femoral hernia, and as a convenient retractor in other incisions.

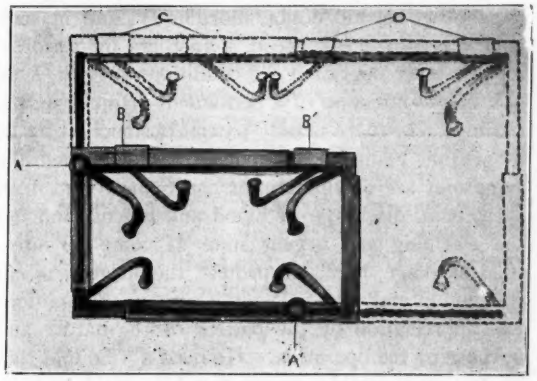

Fig. 1. Herniotomy retractor in its extremes. The shaded drawing represents the instrument closed, 3½ by 2⅛ inches over all. The broken lines outline the instrument fully opened, 5½ by 3½ inches over all, with 3¼ by 2 inches retracting space. A and A′ represent the set screws which hold the sides from slipping after the instrument is set in position. B and B′ are the spermatic cord retainers over which the cord is laid. C and D represent the extremes to which B and B′ may be utilized.

Figure 2 shows the retractor in position with the blades beneath the skin. If to advantage in a given case, the external oblique also may be retracted. A is the ilio-inguinal nerve retracted with the spermatic cord D. B is the divided external oblique muscle. C is the internal oblique and transversalis muscles.

Figure 3 shows a further step in the operation. E is the spine of the pubis illustrating how the stitches are carried well down thereto, making a solid closure. The hemostat was applied to show more clearly the shelving edge of Poupart's ligament.

The advantages of the retractor are:

1. It simplifies the operation by doing away with the retracting assistance, thus allowing the assistant to help with the suturing.

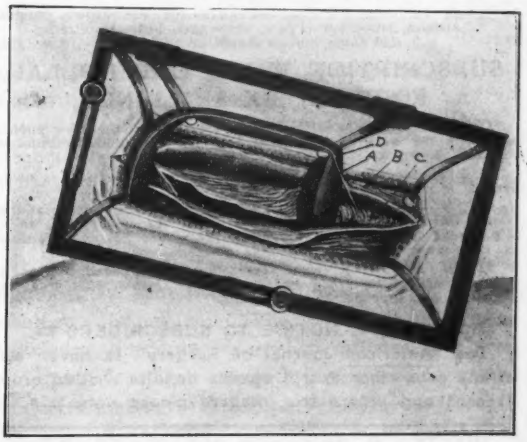

Fig. 2. The retractor in position. A is the ilio-inguinal nerve, B the external oblique muscle, C the internal oblique and transversalis muscles, and D the spermatic cord.

2. It gives a much better exposure and is of special service in large and adherent types of hernia.

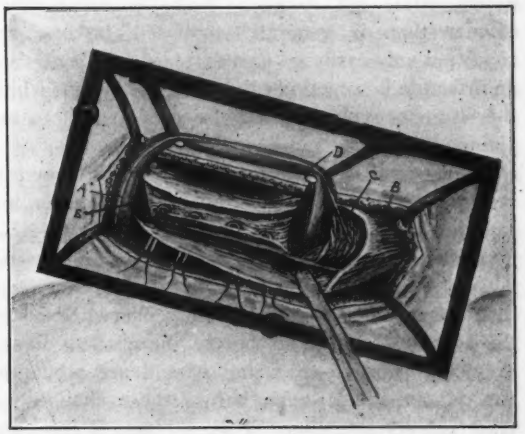

Fig. 3. Further step in the operation with the internal oblique and transversalis muscles, forming the conjoined tendon sutured to Poupart's ligament. E is the spine of the pubis with the sutures running close to it. The other letters represent the same as in Fig. 2.

3. It keeps the spermatic cord out of the way, thus doing away with tape retractors.

4. In Ruggi's inguinal operation for femoral hernia it exposes and retracts the cord.

406 Ohio Building.

* Presented before the Summit County Medical Society, April 4, 1916.

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WALTER M. BRICKNER, M.D., F.A.C.S., Editor

NEW YORK, AUGUST, 1917.

WOUND DIPHTHERIA.

Of much practical importance, it seems to us, is the interesting clinical and bibliographic study of wound diphtheria, published in this issue.

Infections of surgical wounds by Klebs-Loeffler bacilli, while not common, probably occur much oftener than is generally supposed, because the condition may easily go unrecognized. Indeed, such an infection is sometimes the cause of a death which the surgeon explains otherwise or may fail to explain.

That wound diphtheria is not always promptly recognizable is not only because it is a rather unfamiliar phenomenon but also, and chiefly, because its manifestations are not constant or characteristic. This is emphasized by Levy, who also points out that the patient may be suddenly overwhelmed by the accumulating toxins before the changes in the previously normal-appearing wound are accounted for or, sometimes, even before these changes attract serious attention. This, in fact, is the chief value of his communication: it urges the necessity of suspecting the possibility of a diphtherial infection of a wound, when a whitish, grayish, or yellow discoloration or membrane, an otherwise unexplainable necrosis, or an unusual odor, appears. This is important, not only because of the danger of transmitting such an infection to others, but also for the patient's sake, since within a day, or two, after the wound change attracts attention the patient, if a child, may sink into a condition beyond restoration even by vigorous antitoxin treatment.

In hospitals, especially in children's wards, the occurrence of a case of throat diphtheria should be a matter of concern not only to the physician or pediatrist but also to the surgeon. Diphtheria carriers are not few and on this account, too, the hospital surgeon should be on the alert for this serious wound contamination. Its possibility should not be lost sight of whenever he is confronted with an unusual wound appearance.—W. M. B.

COLOSTOMY FOR NON-OBSTRUCTING BOWEL CANCER.

In the face of a complete intestinal obstruction there is no contraindication to operation no matter what the age and the condition of the patient (unless he be, beyond doubt, moribund); and in such an emergency the surgeon is justified in performing whatever operation the conditions suggest, even if it be the infliction of a permanent artificial outlet.

But where there is only partial obstruction by an inoperable malignant neoplasm, that is, when the symptoms are obstipation, or constipation and diarrhea, pain, discharge of blood and mucus, and not the alarming and urgent state of complete intestinal blockage, then, we protest, the surgeon is not justified in making a colostomy without the previous full appreciation by the patient of the nature and purpose of the operation. He need not be told that he has an incurable cancer, but he should be told, if his mind is clear, that he will have an intestinal outlet that will discharge feces upon his abdomen as long as he lives, and he should be allowed to decide himself whether he is willing to accept what the surgeon can give him in exchange for what he takes away.

No matter by what method it is constructed, neither a sacral nor an abdominal "anus" (as we euphemistically call such a bowel outlet) can be depended upon to be controllable. This is especially true when the colostomy is in an individual whose tissues are wasting with advancing cachexia. There is no more pitiable condition than that of an old person slowly dying of a cancer of the bowel, inflicted also with the stench and filth of feces spilling upon his emaciated abdomen, and begging for the closure of the outlet which he thought was but temporary. It is especially pitiable in the home of the poor, unable to secure adequate nursing and sometimes unable even to provide the large amount of dressing material required. And it is, of course, the poor in our hospital wards upon whom the surgeon is most likely to perform a colostomy without full explanation of its consequences.—W. M. B.

DOCTORS OF AMERICA WAKE UP.

Doctors frequently remark *"when my country needs me, I will offer my services"*.

There never was a time in the history of America when your country needed you more and it is calling you NOW, so why not live up to your expression and offer the Government your services at this critical period?

An army without an adequate and well trained Medical Corps, is as impotent as it would be without ammunition. The services of thousands of physicians are needed NOW as Regimental Surgeons, Surgeons for Field, Evacuation and Base Hospitals, Training Camps and on Transports.

While the response from the medical profession for Commissions in the Medical Reserve Corps of the United States Army has been encouraging, many have been deterred from offering their services to the Government at this critical moment on account of the false reports appearing in the daily press regarding the number of physicians killed in action.

In reality, in nearly three years or since the beginning of the war, to June 25th, 1917, there were only 195 doctors killed on the entire Western Front. These figures are authentic, coming from no less an authority than Col. T. H. Goodwin of the British Medical Corps.

In this real hour of need, we are sure that the patriotism of the medical profession of this country will be the stimulus that will induce doctors to come forward and apply for commissions in the Medical Reserve Corps.

An application blank will be found in this issue of the journal. When properly filled out, sworn to and accompanied by two letters of recommendation and a County Clerk's certificate that you are a licensed practitioner, it should be forwarded to your nearest Examining Board. If you are not acquainted with the location of such a Board, this office would be glad to inform you. J. MacD.

Have YOU interested the young physicians in your community, fresh from the hospital, in the medical needs of the Army and the Navy?

The Army and Navy need more doctors—lots of them! Have you offered your services?

Surgical Sociology

Ira S. Wile, M.D., Department Editor.

TWO SURGICAL PROBLEMS.

The recently elected President of the American Medical Association, Dr. Arthur D. Bevan read a paper before the Section of Surgery on the problem of unnecessary operations and of incompetent surgeons. His treatment of the subject was exceedingly conservative, although possibly the public acknowledgment of the existence of these two defects might be regarded as somewhat radical.

It is exceedingly promising that a large medical organization consciously and willingly views its problems, defines them and attacks them. The knowledge that unnecessary operations have been performed has been more or less general but the exactness and careful technic of surgery have so minimized the inherent dangers that the profession has not strongly emphasized the undesirability of the rush to the unrequired scalpel.

For many years surgery has advanced exceedingly rapidly and to many, apparently has outstripped medicine. New surgical fields have been explored and operative procedures have been perfected to meet the requirements of surgery in all parts of the body.

Many thousands of persons have undergone operations for the relief of conditions from which they would have died during a previous generation. The very growth and expansiveness of surgery are responsible for its shortcomings. Incompetents have rushed in where wiser heads would have felt the restraint of conscience. Results which might have been satisfactory have been complicated because of imperfect technic. Opportunities for the training of surgeons has been inadequate and every tyro has felt himself competent to attempt difficult operations.

It is unfortunate that the commercial returns of surgery need be regarded as an element contributing to the conditions which Dr. Bevan deprecates. Many tonsils have been removed where actual need could scarcely be justified. Normal appendices have seen the light of day as the result of bad judgment. Ovaries have been removed for conditions for which they were not responsible, as the result of ignorance.

It is timely that the medical profession itself should take cognizance of surgery as it exists today and make an effective investigation of the therapeutic results, the mortality, the probability of

complications, the possibilities of palliation, relapses or consequent impairment of other functions. An evaluation of surgery would be immensely valuable as a check to unwarranted and imperfect operations.

Dr. Bevan suggests, for example, a study of intestinal stasis and its surgical therapy. He indicates that the study should be made by a group of men such as internists, neurologists, physiologists, pathologists, roentgenologists and surgeons. The opinion of the group would certainly be far more conclusive than the judgment of a single individual with a biased point of view.

It is obvious that if group diagnostics could be practiced and diagnostic clinics were developed to afford this opportunity, ante operation, fewer unnecessary operations would be performed.

The problem of incompetent surgeons is largely one of education. It may be necessary for medical institutions to provide for the granting of a degree in medicine and one in surgery, making somewhat different provisions for the two degrees as is already provided in part in England. Practical surgical work, surgical interneship, and an apprenticeship in surgery would go a long way toward removing present weaknesses arising from the practice of surgical incompetents.

Fortunately for the reputation of the medical profession the number of incompetents is not alarming. The surgical profession is rich with conscientious, honest, well-trained, devoted and self-sacrificing men and women whose noble efforts redound to the credit of the profession. They have brought surgery to the high estate in which it is now to be found. This fact, however, should not serve to preclude a careful study of the shortcomings of surgery with a view to removing them. The profession must purge itself of those who are ignorant and dishonest as well as those whose judgment lacks balance. It is far better for the profession to have its faults pointed out by one of its own members and to have them attacked by its own members than to permit, with knowledge, the continuance of wretched defects which impede its progress. The subject is too important to be neglected, too delicate to be handled carelessly, too significant to be ignored. Modern surgery is sufficiently vigorous to face its own problems and to solve them.

Your country is at war! Are YOU going to help it?

Book Reviews

A Practical Treatise on Fractures and Dislocations. By LEWIS A. STIMSON, B.A., M.D., LL.D., Professor of Surgery, Cornell University Medical College; Consulting Surgeon, New York and Bellevue Hospitals, etc. *Eighth Edition.* Octavo; 946 pages; 475 illustrations and 39 plates. New York and Philadelphia: LEA & FEBIGER, 1917. $6.00.

In the review of each new edition of this standard work we refer to it as a "classic"; and, indeed, we know no modern medical treatise more consistently deserving of that title. It is more than authoritative; it is altogether complete. In the preparation of each edition Stimson combs the literature critically and with exceeding care. His work always contains references to almost every contribution worth quoting; it includes nothing unworthy of quotation; and all references are presented with admirable critique. His painstaking thoroughness is remarkable in a man of his years; it is a severe example for younger and, most of them, more careless authors.

Since the last edition (1912) Stimson has twice visited the military hospitals of France and he has included in this edition much that he saw there of the recent postural and other modifications of the treatment of compound fractures. Indeed, the chief changes in his book are in the section on treatment. Concerning the operative fixation of fractures Stimson has crystallized his views. He admits a limited field for the Lane plate, but still objects, very properly, we think, to the employment of non-absorbable internal fixation appliances when they can be avoided. He describes as ingenious Hawley's temporary wire loop fixation method. We are at a loss to understand why he fails to illustrate and describe Hawley's still more ingeniouh fracture table. The traction method for reducing femur fractures illustrated on page 405 seems to us much inferior to Hawley's.

In the section on dislocations Stimson has revised chiefly his discussion of congenital dislocation of the shoulder and dislocations due to paralysis, and he has added to these "birth dislocations" and "posterior subluxations of infancy," the latter due to palsy. It is interesting to note that while in previous editions Stimson, like Hamilton and others, denied the possibility of subluxation of the shoulder except as an accompaniment of palsy or arthropathy, in this edition he admits the cases reported by Ross and by Brickner as illustrating purely traumatic forward subluxation of the shoulder. He has introduced a description, from Hazlehurst's study of the injury, of dislocation of the major cornu of the hyoid bone.

The Breast: Its Anomalies, Its Diseases, and Their Treatment. By JOHN B. DEAVER, M.D., LL.D., Sc.D., Professor of the Practice of Surgery, University of Pennsylvania; Surgeon-in-Chief to the German Hospital; Visiting Surgeon to the Hospital of the University of Pennsylvania; Consulting Surgeon to the Germantown, The Philadelphia General, St. Agnes and Mount Sinai Hospitals, Philadelphia; and JOSEPH MCFARLAND, M.D., Sc.D., Professor of Pathology and Bacteriology in the Medical Department of the University of Pennsylvania; Pathologist to the Philadelphia General Hospital. Octavo; 724 pages; illustrated; Philadelphia: P. BLAKISTON'S SON & Co., 1917. Price, $9.00.

This book is a distinct contribution to medical literature. It reminds one very much of Cullen's recent monograph on the Umbilicus and its Diseases for its comprehensive scope and completeness and the large material upon which the text is based. Particularly valuable are the chapters on the congenital and acquired anomalies, which are profusely enough illustrated and embrace every known type of breast aberration. The chapters on tumors, especially carcinoma, are very illuminating, and both surgical treatment and non-operative therapy find ample space for description and discussion. The question of early diagnosis receives special emphasis. An extensive bibliography has been drawn upon by the authors and is appended to the respective chapters.

The Newer Methods of Blood and Urine Chemistry. By R. B. H. GRADWOHL, M.D., Director of the Pasteur Institute of St. Louis, and the Gradwohl Biological Laboratories, St. Louis, and A. T. BLAVIS, Assistant in the same; Sometime Technician in Pathological Chemical Laboratories, New York Post-Graduate Medical School, etc., etc. Octavo; 240 pages; 65 illustrations and four color plates. St. Louis: C. V. MOSBY COMPANY, 1917.

Here is a book that is most timely. In the past few years, chemists have been most active in devising new tests, especially upon the blood, which have aided us especially in the prognosis and treatment of certain diseases, especially diabetes, nephritis and the conditions associated with acidosis. We refer, for instance, to such tests as the determination of the carbon dioxid tension of the alveolar air, the hydrogen-ion concentration of the blood, uric acid determinations, tests for non-protein nitrogen, quantitative tests for blood sugar, etc. Incidentally, it should be a maker of pride that most of these newer researches are of American origin. To the uninitiated the comprehension of these newer methods has been difficult owing to the extraordinary activity with which this work has been pursued and the multiplicity of the publications. The authors, therefore, deserve much praise for having "boiled down" the immense data in a book of reasonable dimensions. Moreover, they have done their work well. The explanations are clear, comprehensive and readily understandable to those who have only a working knowledge of chemistry. Moreover, the reader is not troubled by a multiplicity of methods, but is furnished with only the one that the authors deem best. Furthermore, if the reader wishes to pursue his investigations further, numerous references are added to aid him. From every point of view this book deserves a wide success.

Handbook of Suggestive Therapeutics, Allied Hypnotism, Psychic Science, a manual of practical psychotherapy, designed especially for the practitioner of Medicine, Surgery and Dentistry. By HENRY S. MUNRO, M.D., Omaha, Neb. *Fourth Edition,* Revised and Enlarged. Octavo; 481 pages. St. Louis: C. V. MOSBY COMPANY, 1917.

Despite the ambitious title, this book contains nothing more than an exposition of the general principles of ordinary suggestion as practiced by every sensible physician, with a little hypnotism thrown in. Although the author speaks everywhere of "my methods," we have failed to discover any originality in any of the methods which he describes. The text is verbiose to a degree, and the brand of psychology displayed is more applicable to the lay than to the professional understanding. The author bothers himself very little with diagnosis, but dilates upon his achievements and the importance of suggestion interminably. We have found little to inspire us in the perusal of this book.

The Diagnosis and Treatment of Abnormalities of Myocardial function, with special reference to the use of graphic methods. By T. STUART HART, A.M., M.D., Assistant Professor of Clinical Medicine in the College of Physicians and Surgeons, Columbia University; Visiting Physician to the Presbyterian Hospital in the City of New York. Octavo; 320 pages; 248 engravings, 240 of which are original. New York: THE REBMAN COMPANY, 1917.

This is a book that we have been looking for for some time. The majority of the books that have been written upon the newer phases of cardiac pathological physiology are written in a manner too difficult for any but special workers in this subject to comprehend or are devoted to certain specialized spheres. Here is a book, however, that is written in understandable English and in which the clinical as well as the laboratory aspects of the subject are emphasized. It is therefore exactly the kind of work that we can recommend for beginners in this complicated and important field. We have only one criticism to make. In subsequent editions we suggest that the electrocardigrams or polygrams be placed in or opposite the page of explanatory text. This will simplify the reading immeasurably.

Progress in Surgery

A Résumé of Recent Literature.

On Lung Abscess As a Sequel to Tonsillectomy. IRA FRANK, Chicago. *The Laryngoscope,* June, 1917.

Frank reports three cases of lung abscess in adults following tonsillectomy. He points out that the operations were done skilfully and thinks that faulty technique plays an important role in the causation of the condition. From a questionnaire sent to a number of laryngologists, internists and surgeons he concludes:

The majority of these cases occur after operations under general anesthesia, in young adults between twenty and thirty-five.

In the three cases reported examination revealed incomplete or destructive operative results. Two gave a history of post-operative bleeding.

The majority of the lessons are aspiratory in origin, as evidenced by the location, the ease of aspiration, the occurrence of single abscesses in practically every case, the predominence of the complications the free clinics and charity hospitals, and, finally, the number of analogous conditions that can cause lung abscess in no other way. They are the result of pneumonia, of lobar, bronchial or focal type, induced by either the anesthetic, aspiration or septic embolism. The greater number are doubtless due to the second factor and are therefore largely preventable.

A more general use of local anesthesia for tonsil surgery, the abolishment of rapid tissue destroying operations and a respectful attitude toward hemorrhage and the secretions of the operative field will do much to relieve the surgeon of serious liability.

A Case of a Rare Foreign Body in the Oral Cavity. JOHN L. LOUGEE, Boston. *The Laryngoscope,* June, 1917.

A child of six was bought to the author on account of an impediment of speech and a foul breath. At the age of two it was supposed to have swallowed or inhaled a foreign body. No evidence of it could be found at the time. For some weeks the boy had a sore mouth; the saliva was blood stained and he refused to eat. He was well for two years when the mother noticed the speech defect and the foul breath. No cause could be found at the time. This persisted for two years when the author was consulted. He noticed an extreme mobility of the tongue. It was found that the frenum had been entirely severed and that there was a necrotic area on the floor of the mouth of the size of a dime. A metallic object which proved to be a ring was encircling the tongue and was completely buried in the tissues. The ring was cut and removed. Complete recovery.

Fibroma of the Left Nasal Chamber with Extension into the Post-Nasal Fossa. Report of a Case. THOMAS CHEW WORTHINGTON, Baltimore, Md. *The Laryngoscope,* June, 1917.

This was a fibroma durum of naso-pharynx springing from the sphenoid and filling the left side of the nose, eroding the septum and the external nasal wall. Several attempts made to remove it under general anesthesia were only partly successful owing to extensive hemorrhage. Finally under X-ray treatment it disappeared. Up to the time of the patient's death, ten years later it had not come back. Death was due to nephritis from alcoholism and was in no way connected with the growth.

The Removal of Tonsils as a Prophylactic Measure in all Children of Four Years of Age. RICHARD W. PERRY, Seattle, Wash. *The Laryngoscope,* June, 1917.

The author takes the radical position that all tonsils in all children should be removed as a prophylactic measure. He holds that the tonsil is a lymph gland that has broken through its capsule and is exposed to the infections al-

ways present in the mouth. Nature attempts its removal by converting it into connective tissue. Early removal is advised for the early protection against infectious disease and because the operation is simple in direct proportion to the youth of the patient and safe in direct proportion to its simplicity.

Local Anaesthesia for Tonsillectomy. JOHN A. THOMPSON. *The Ohio State Medical Journal,* July, 1917.

The anesthesia is obtained by blocking the nerves supplying sensation to the tonsil. Theses nerves are the posterior palatine nerve and the external palatine nerve, also the branches from the glossopharyngeal nerve.

The posterior palatine is readily reached by injecting ten minims of one per cent. novocaine with a few minims of adrenalin into the palate at a point just in front of and internal to the hamular process of the internal pterygoid plate of the sphenoid.

It is not necessary to inject directly into the nerve; surface contact is sufficient.

A Description of a Low-Cost Motor Outfit. MAYNARD C. HARDING, San Diego. *American Journal of Orthopedic Surgery,* July, 1917.

The instrument has stood almost three years of use without causing the least trouble. The motor is an ordinary Menonimee commercial motor, 1/40 H.P., with the poles connected in parallel to give it slightly greater power and speed. It weighs five pounds. The handle containing the thumb switch, and the threaded mandrel for the chuck were added by an electrician. The chuck is an ordinary machine drill chuck taking a bit up to 5/16 inch. No locking device is necessary, a slight turn with pliers serves to lock the saw or drill securely. The sterilized cover is made of heavy drilling or light duck. The cover opens all the way down, and is readily fastened by dressmaker's snaps.

To prepare the motor for use, the chuck is removed and boiled with the instruments. The mandrel and face of the motor are painted with pure carbolic acid, which is wiped off but not neutralized. The sterile case is then laid face down across the table and the mandrel pushed through the brass grommet of the case, after which the nurse fastens the snaps, and the surgeon screws the chuck in place.

One original principle of this motor is the type of saw, which is not designed to cut by force, but by friction. It will not burn a bone because it will choke itself before that much friction has been developed, so it is unnecessary to drop water upon the revolving saw. This does away with one of the most disagreeable features of more powerful motors. The saws selected, after considerable experimentation, are manufactured by the Atkins Saw Company of Indianapolis. Their descriptions is as follows: "1½ in. x 24 ga. circular saws with one hundred teeth for bone cutting; 3/32 in. hole." These saws can be purchased with or without a mandrel, the ones in use by Harding being ⅛ in. in diameter. Machine twist drills are the best for general work, as they can be secured everywhere and in any size.

The total cost of this outfit, including a dozen saws, is inside of $30.00. It will do almost anything a higher priced instrument will do. The hand-controlled switch, always under the thumb of the operator, is much safer than a foot switch, in Harding's experience.

Xanthochromia and Other Changes in the Cerebrospinal Fluid. CHARLES A. ELSBERG AND EDWARD L. ROCHFORT, New York. *Journal of the American Medical Association,* June 16, 1917.

Elsberg and Rochfort base their study on 92 cases of spinal disease, in fourteen of which the spinal fluid was yellow.

They conclude:

1. Xanthocromia is stronly suggestice of spinal cord tumor, in the lower dorsal and lumbar regions.

2. The combination of yellowness, high protein content, spontaneous coagulation and pleocytosis (Froin's syndrome) is characteristic of the large endotheliomas or sarcomas which surround the conus and roots of the cauda equina.

3. Nonne's syndrome (increase of globulin, without increase of cells) is suggestive of extramedullary spinal cord tumor.

4. Increase of globulin without increase of cells plus yellow discoloration of the fluid make the diagnosis of extramedullary spinal cord tumor very probable.

5. The changes in the fluid may be a valuable aid for the differentiation between spinal diseases in which operative interference may be necessary.

6. Th diagnosis of a spinal disease should never be made from the spinal fluid findings alone; the results of the examination of the fluid obtained by lumbar puncture should be used only as a diagnostic aid.

The Treatment of Septic Incomplete Abortion. HIRAM N. VINEBERG and SOL. WIENER, New York. *American Journal of Obstetrics,* June, 1917.

The authors emphasize the importance of early emptying of the uterus in febrile incomplete abortions. Of 287 cases under treatment by them during a period of five years ending January 1, 1916, there were sixty cases which had temperature ranging from 101° to 105°, many of which had admitted instrumental interference, either by themselves, midwives or doctors, and all had probably been tampered with. Vineberg asserts that a spontaneous miscarriage is never attended with febrile manifestations, the one exception being a retroflexed or retroverted uterus. In the entire series there were two deaths. Before operation it is important to determine whether the uterus contains retained tissue which has become infected. Curetting an empty septic uterus can do no good, rather harm. It is important to prepare the vulva by shaving and scrubbing. No preparatory dilatation with gauze in the cervix is employed. In cases less than eight or ten weeks of gestation, curettage with a sharp curette; in cases more advanced a vaginal hysterotomy gives the best results.

Hydatidiform Mole, PALMER FINDLEY, *American Journal of Obstetrics,* June. 1917.

In an analysis of 500 cases of mole pregnancy from the literature and his personal records, Findley finds that 31.4 per cent. or 157 cases have been followed by chorioepithelioma. These, however, display less malignancy than the chorive pithelioma which follow upon a normal pregnancy. A comparison of the mortality from neoplasms of the chorion shows 32.9 per cent. following hydatid mole chorioepithelioma, 64.3 per cent. from abortion chorioepithelioma and 67 per cent. following full term pregnancy. In the 500 cases of mole he found that of 265 benign moles there were recoveries in 237 and deaths in 28, a mortality of 10.5 per cent.; while of 99 moles, which later became malignant, there were 45 recoveries and 54 deaths, a mortality of 54.5 per cent.

Hemorrhages especially during the first trimester, mucosanguineous discharges and alterations in the size of the uterus are the most important clinical symptoms.

Some Observations on Nitrous Oxide Gas as an Analgesic in Labor with Report of 135 Cases. GEORGE H. RYDER, New York. *American Journal of Obstetrics,* June, 1917.

Nitrous oxide gas has been proven to be a safe analgesic in labor. It gives some relief in at least 90 per cent. of cases, and in over half the cases there is marked relief. It is especially useful when the pains are severe and of long duration. The pains are either unaffected by its administration or are strengthened in 80 per cent. of cases. In intelligent patients the gas is more effectual. It is cheap, averaging 43 cents for ward patients and slightly more for private patients. Good results may be obtained without the mixture of oxygen. It does not predispose to postpartum hemorrhage. Its use increases the number of forceps operations about 21 per cent. in this series.

APPLICATION FOR APPOINTMENT
IN THE
MEDICAL RESERVE CORPS, U. S. ARMY

....., 191

To the SURGEON GENERAL, U. S. Army,
Washington, D. C.

Sir:

I hereby make application to be examined for appointment in the Medical Reserve Corps, U. S. Army, and inclose testimonials as to my character and habits.*

I certify that to the best of my knowledge and belief I am laboring under no mental or physical infirmity or disability which can interfere with the efficient discharge of any duty which may be required of me if appointed in the Medical Reserve Corps, U. S. Army, and that the answers given to the interrogatories below are true and correct in every respect.

I furthermore state my willingness to proceed to such point for examination as may be designated by the Surgeon General, with the understanding that the journey entailed thereby must be made at my own expense.

INTERROGATORIES.

1. What is your name in full (including your full middle name)?

2. What was the date of your birth?

3. Where were you born? (Give State and city or county; if foreign born, give country.)

4. When and where were you naturalized? (For applicants of alien birth only.)

5. Are you married or single? 6. Have you any minor children; if so, how many?

7. What is your height, in inches? 8. Your weight, in pounds?

9. Give the nature and dates of all serious sicknesses and injuries which you have suffered?

10. If either parent or brother or sister has died, state cause and age in each case:

11. Do you use intoxicating liquors or narcotics; if so, to what extent?

12. Have you found your health or habits to interfere with your success in civil life?

13. What academy, high school, college, or university have you attended? State periods of attendance from year to year, and whether you were graduated, giving date or dates of graduation:

14. Name any other educational advantages you have had, such as private tuition, foreign travel, etc.:

15. Give all literary or scientific degrees you have taken, if any, names of institutions granting them, and dates:

16. With what ancient or modern languages or branches of science are you acquainted?

*Testimonials as to character and habits from at least two reputable persons must accompany this application. Political recommendations are not necessary.

17. How many courses of lectures have you attended? Names of colleges and dates:

18. When and where were you graduated in medicine?

19. Have you been before a State examining board? If so, state when, where and with what result: *

20. Are you a member of any State medical society? If so, give its name:

21. Have you had service in a hospital? If so, state where and in what capacity, giving inclusive dates of each kind of service:

22. What clinical experience have you had in dispensary or private practice?

23. Have you paid particular attention to any specialty in medicine; if so, what branch?

24. What opportunities for instruction or practice in operative surgery have you had?

25. Have you previously been an applicant for entry into the United States service? If so, state when, where, and with what result (if rejected state why):

26. Are you a member of the organized militia? If so, state with what organization and in what capacity:

27. Have you been in the military or naval service of the United States as cadet or otherwise? If so, give inclusive dates of service with each organization, designating it:

28. What occupation, if any, have you followed other than that of student or practitioner?

29. What is your present post-office address?

30. What is your permanent residence?

31. (Signature of applicant) .....

32. The correctness of all the statements made above was subscribed and sworn to by the applicant before me this day of , 191 .

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* This application must be accompanied by a certificate from the proper official that the applicant is duly registered to practice medicine in the State in which he resides.

Form 149
W.D., S.G.O.
(Revised May 3, 1917)

APPLICATION FOR EXAMINATION FOR APPOINTMENT IN THE MEDICAL RESERVE CORPS, U. S. ARMY.

.....Inclosures.